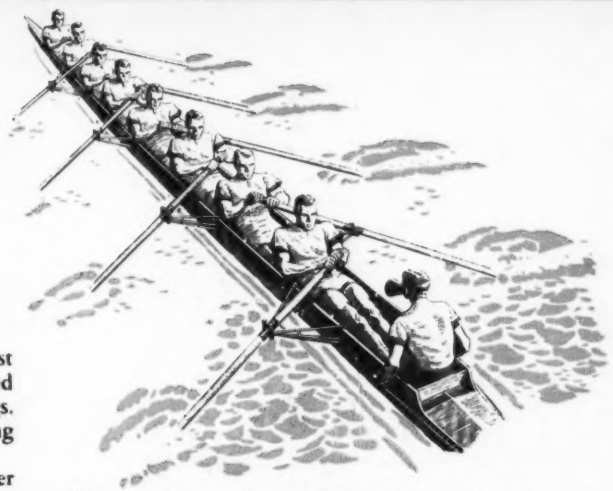
PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

"NOT A LAGGARD IN THE GROUP!"



gave Tide Water's Green Cast Greases the toughest
n our plant," said this engineer. "They have smoothed
the troublesome job of lubricating the mill bearings.
reat many mills are required in our process. Bearing
sures are high . . . so are the temperatures.
Formerly, there were times when through improper
ication a bearing would heat up to a danger point
we would have to shut down that particular mill.
mills are hooked up in groups of eight; a shut-down
ne threw all eight out of production. With Tide
er Green Cast Grease on the job . . . there is not a
ard in the group."
olving difficult lubrication problems is easy for Tide
er Green Cast Greases. They are compounded of the
paraffine base cylinder stock — readily identified by
natural green cast. In using a maximum amount of
icating oil per pound of grease you are assured a
er, more economical lubricant. Savings that run as high as 30% are frequent. Tycol Green Cast Greases are of unusual stability and are compounded in a variety of consistencies to suit every purpose — indoors or out.

Try Tide Water Green Cast Grease on your toughest job. You'll get the type of convincing proof that an ever-increasing number of users experience . . . better performance and more economical operation. Complete information is yours for the asking.

TIDE WATER ASSOCIATED OIL COMPANY
TIDE WATER DIVISION
17 Battery Place, New York, N. Y.

Flying Yankee, Crack
of the Boston and Maine
Maine Central Railroad,
of many Diesel pow-
units lubricated with Tide
ater Diesel Lubricants.

TIDE WATER INDUSTRIAL TYCOL OILS-GREASES

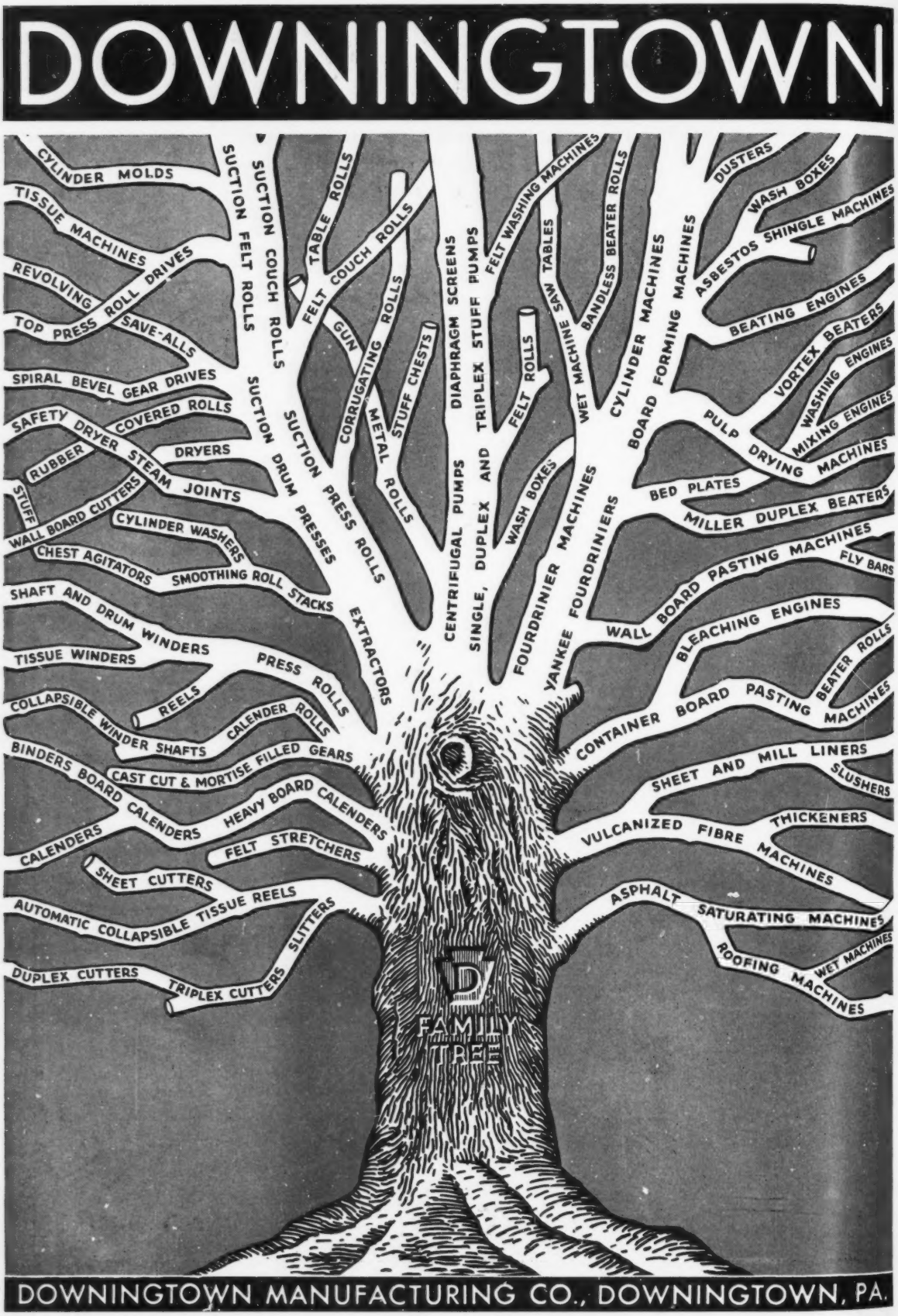
Lubricants

THERE IS A COMPLETE LINE OF TYCOL LUBRICANTS SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE

NOV. 18 1937

Vol. CV No. 21

UNIVERSITY OF WASHINGTON SEATTLE



Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial office: 15 W. 47th St., New York, N. Y.
Domestic subscription U. S. and possessions, $4.00 per year.

PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

Executive and Editorial Offices: 15 West 47th Street, N. Y. C.
Western Rep.—H. K. Vinton, 123 W. Madison St., Chicago, Ill.

The Contents of this Publication are Copyrighted

TABLE OF CONTENTS

TAPPI Inspects New Syracuse Laboratory .. 11
Canada May Increase Newsprint Production .. 12
Mill at New Windsor Reopens 13
New Blue Hill Text 13
To Study New England Freight Rates 13
Austria Increases Paper Production 13
Kimberly-Clark Seeks New Labor Ties 14
Stocks in Hand Slows Down Chicago Markets 15
Japan Imports More Pulp 15
Thunder Bay District Plans Large Output .. 16
Uruguay Imports More Newsprint 16
Philadelphia Awaits Improved Paper Demand 17
Financial News of Pulp and Paper Industry 18
Natural Method of Drier Drainage 20
Paper Industry of Northwest 26
Self-Sealed Bearings 26
To Build Reservoir in Cedar River 26
Papermaking at Rockefeller Center 26
Czechoslovakia Concludes Cartel 26
Construction News 30
Obituary 32
Newspring Production Increases 32
Editorial 34
Cost Finding Committee Meets 35
Production Ratio Report 35
Prospects Bright on Coast 35
T. S. Nichols Made Vice-President 35
Technical Section
Review of the Paper Industry Literature .. 37
Delaware TAPPI Discusses Greaseproofing 40
Grinding of Loblolly Pine. Relation of Wood Properties and Grinding Conditions to Pulp and Paper Quality 41
Wins Decision in Patent Case 48
Imports of Paper and Paper Stock 49
New York Market Review 52
Miscellaneous Markets 54
Market Quotations 56

The PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Copyright, 1937, by the Lockwood Trade Journal Co., Inc.

SONOCO SPIRAL WOUND RETURNABLE AND NON-RETURNABLE PAPER MILL CORES

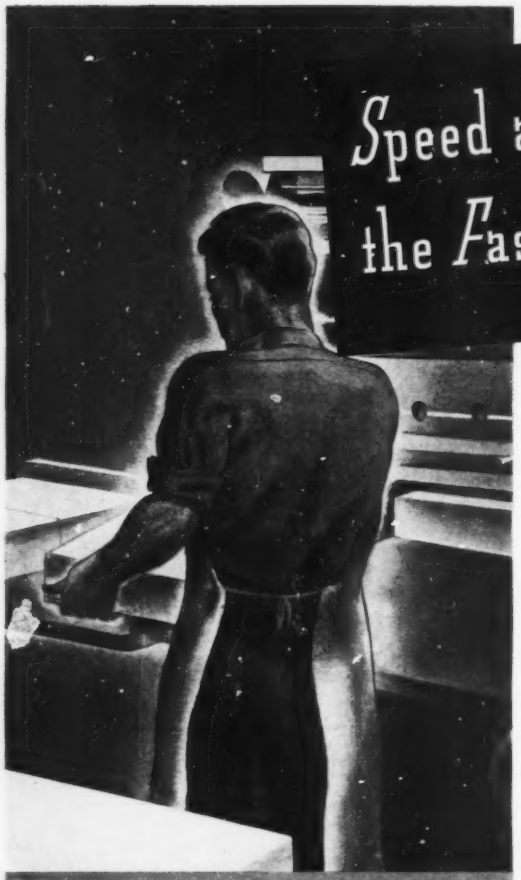
NO GUESSWORK

You can't afford to guess, when you buy supplies for your mills. There's no guesswork involved when you purchase Sonoco Cores. They've been tried and tested in hundreds of mills and have been found to be of paramount quality, long durability and utmost dependability.

If you're not using Sonoco spiral wound returnable and non-returnable paper cores, write today for samples and prices.

SONOCO PRODUCTS COMPANY

BRANTFORD, ONT. HARTSVILLE, S.C. MYSTIC, CONN.



Speed all Multiple Cutting with the Fastest Machine Ever Built

• The Seybold Precision Electric Automatic Spacer Cutter is especially designed and built for production cutting in all of the graphic arts, paper mill, paper and allied trades, manufacturing stationers and all paper converting trades. A utility cutting unit—really two machines in one.

A rapid production cutting machine, adaptable for all classes of multiple form or repeat cutting. Profitably used on all packaged papers—second sheets, filler and all loose leaf sheets—memorandum pads—tablets, note and composition books, school books and any class of work on which there are a multiplicity of cuts.

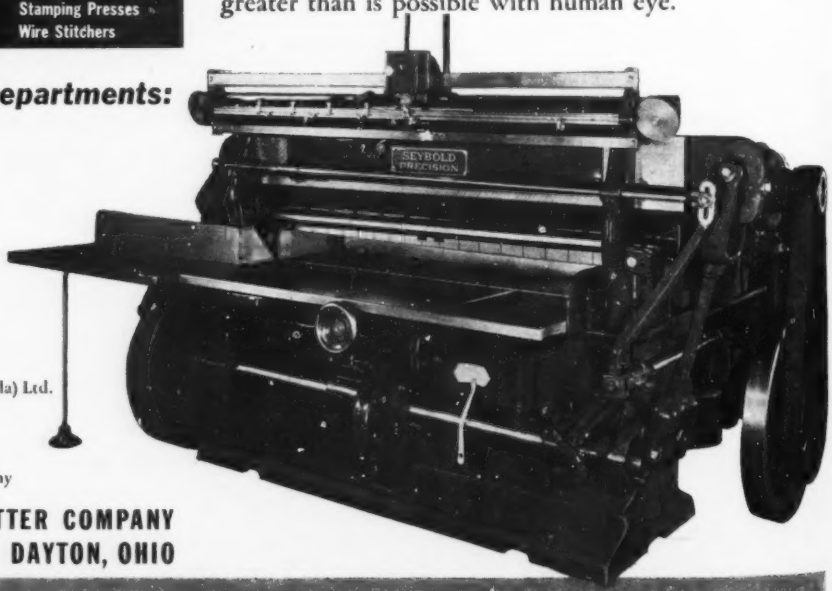
Taking away all manual operation of the back gauge, automatic spacing leaves operator free to do the actual cutting only. Spacing with accuracy greater than is possible with human eye.

PRODUCTS BY SEYBOLD

Book Compressors	Drilling Machines	Punching Machines
Book Trimmers	Embossing Presses	Round Corner Cutters
Cutting Machines	Knife Grinders	Stamping Presses
Die Presses	Perforators	Wire Stitchers

Sales and Service Departments:

- New York: E. P. Lawson Co., Inc. 426-438 W. 33rd Street
- Chicago: Chas. N. Stevens Co., Inc. 110-116 W. Harrison Street
- Atlanta: J. H. Schroeter & Bro., Inc.
- San Francisco, Los Angeles, Seattle: Harry W. Brintnall Co.
- Dayton. Seybold Factory
- Toronto: Harris-Seybold-Potter Co. (Canada) Ltd.
- London, England: Smyth-Horne, Ltd.
- Latin America and West Indies: National Paper & Type Company



HARRIS · SEYBOLD · POTTER COMPANY
SEYBOLD DIVISION • DAYTON, OHIO

SEYBOLD *Precision Electric Automatic Mill Spacer Cutter*

PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

SIXTY-SIXTH YEAR

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CV, No. 21 Thursday, November 18, 1937

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.

TAPPI Inspects New Syracuse Laboratory

Empire State Section After Seeing New Building At New York State College of Forestry, Holds Interesting Meeting At Which Prof. C. E. Libby Presides—Mill Sanitation and Southern Pine Pulping Discussed.

[FROM OUR REGULAR CORRESPONDENT]

SYRACUSE, N. Y., November 15, 1937—About one hundred members and friends of the proposed Empire State Section of the Technical Association of the Pulp and Paper Industry met at Syracuse, N. Y., on Saturday, November 13, 1937. C. E. Libby, Professor of Pulp and Paper Technology at the New York State College of Forestry, presided as chairman.

The meeting began with a luncheon in the College of Home Economics at which time the members were welcomed by Dean Spring of the College of Forestry.

Inspect New Laboratory and Mill

Following the luncheon the new Pulp and Paper Laboratory Building was inspected.

The laboratory building is made of brick and concrete. Its two specific purposes are for the instruction of students and for scientific and industrial research in the production of pulp and paper.

In the paper testing room may be obtained virtually any relative humidity between 20 and 90 per cent; likewise, any temperature may be obtained within the range of 40 to 100 deg. F. Under normal conditions this section of the laboratory is operated at 70 deg. F. and 65 per cent relative humidity. This particular room has been especially equipped for great flexibility in producing varying conditions for paper testing. The room was built in this manner in order to permit the college to carry on research under all reasonably possible conditions of temperature and humidity.

The color laboratory is one of the most modern. The light in this room is wholly of the daylight variety. A new measuring lamp equipped with special glasses of two different types has been devised and used in the laboratory for the exact measuring of shade.

After the colored paper has been made and dried it is tested. A small sample is placed in an instrument called a fadometer. This instrument is equipped with a brilliant arc lamp. One hour's exposure of this light is equivalent to two hours of brilliant sunlight in the summer and eight hours of winter sunlight. The samples are exposed for a number of hours and the extent of fading is noted and recorded.

From time to time various industries have demonstrated interest in the pulp and paper courses and laboratories at the New York State College of Forestry. The most recent evidence of this interest is to be found in the presentation to the college of large size samples of all the dyestuffs sold by various manufacturers of these products. The value of these gifts amount to several hundred dollars.

The largest and most expensive unit of the laboratory is the partially installed paper machine. This machine was especially constructed for the laboratory. This laboratory unit is a commercial machine. There are no other educational institutions in the country that have an experimental machine as large as this unit. It has a top capacity of approximately six hundred pounds of paper per hour. It will produce a sheet of paper forty-six inches wide which will run over the machine at a speed of five hundred feet per minute.

This paper machine is a combination of two machines, one of which is the fourdrinier type commonly employed by all paper mills manufacturing papers such as newsprint and writing papers. The other section of the machine is used in manufacturing heavy papers like building and box boards.

A woodgrinder has been installed. It is a replica of the most modern of commercial grinders although it is not quite as large. It is the only experimental unit ever built of this type, known as the Great Northern grinder. An unusual feature of this machine is two magazines in which the wood is arranged ready for grinding while the grinder is in operation. When the wood being ground is exhausted the floor of the magazine is released and the wood, which has been placed in it, falls into the pocket of the machine and conversion into pulp begins immediately. This type of grinder is especially valuable for instructional purposes as it eliminates danger in arranging the wood in the pockets of the old type of grinder. It will run at higher speeds than any commercial grinder now in use. It is driven with a direct current motor and the speed can be varied at will.

"There are still other interesting features of this new pulp and paper laboratory such as the chemical pulp digester, a pulp beater of unusual design and a refiner.

The old laboratories of the college have made many contributions to the industries by devising new and more economical methods of manufacture and it is believed that this much more completely equipped

(Continued on page 28)

Canada May Increase Newsprint Production

New and Important Agreement Between Mills and 75 Per Cent of Australian-New Zealand Publishers Includes Increased Newsprint Tonnage—Bowater Co's. Proposed Newfoundland Mill—Other Trade News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 15, 1937—Announcement was made here this week of a new and highly important agreement between a group of Canadian newsprint manufacturers and interests representing 75 per cent of the Australian-New Zealand publishers. The agreement provides for the stabilization of the market for a seven-year period and involves increased tonnage for Canadian producers. The negotiations were conducted on behalf of the Australasian publishers by William Dunstan, of the Melbourne Herald group of newspapers, and it was Mr. Dunstan who announced the details here.

The new arrangement covers the period 1939-45 inclusive. Under its terms, the group of North American companies shipping to that market will provide between 75 and 80 per cent of the total consumption, less such tonnage as may be produced when a newsprint mill now planned in Tasmania may come into production sometime in 1942. Considerable importance attaches to the agreement on prices, which provides that a rate to the Australasian consumer shall be the New York price, less freight to New York, plus ocean freight and insurance from North American Atlantic and Pacific ports to main Australian and New Zealand ports. Total Australasian consumption at the present time is around 200,000 tons.

In discussing the agreement, Mr. Dunstan said that he would like to have recorded his tribute to the fair-mindedness and ability to appreciate the consumers' special problems exhibited by the Canadian companies throughout the several months of negotiations. That the newsprint producers had their own weighty problems he was well aware, said Mr. Dunstan, and it was because of this readiness on both sides to understand the other's viewpoint that the negotiations had reached an early and mutually very satisfactory conclusion. "It is a model arrangement," summarized Mr. Dunstan, "and one that might with advantage be copied."

Parties to the agreement include, on the one side, the Melbourne Herald group, of which Sir Keith Murdock is the head, and with which Mr. Dunstan, who is general manager of the Melbourne Herald and Weekly Times, is associated; the Associated Newspaper group, of Sydney, headed by Sir Hugh Denison, and the Sydney Morning Herald group, headed by A. H. Stuart, together with some independents, and on the producers' side, Consolidated Paper, Price Bros., International, Mersey, Powell River, St. Lawrence, and Pacific Mills.

Bowater Co.'s Proposed Newfoundland Mill

The decision of the Newfoundland Government on the tentative agreement under which the Bowater Llodys Company of London would erect a 226-ton sulphite pulp mill on the Gander Lake district of Newfoundland has been delayed while the company seeks an extension of its option on the property concerned. According to a dispatch from St. John's, Newfoundland, when the company first approached the government with proposals for the mill's establishment, they asked renewal of leases on all properties concerned on a 99-year basis; freedom from import duties on machinery; construction material and material used in manufacturing; and exemption from all taxes other than income assessments.

The company also asked the right of compulsory acquisition of land for purposes of the company; construction by the government of a railway from the mill to the main line of the Newfoundland Railway; and unrestricted export of pulpwood from their properties up to an amount that would not endanger supplies for the mill.

In return Bowater would erect, and have in operation by 1941, a sulphite pulp mill of 200 tons daily capacity, employing about 300 persons steadily in the plant and part-time woodsmen up to 3,000 in a capacity year. A modern town for workmen would be constructed.

A week ago R. B. Ewbank, commissioner of natural resources, announced terms of a tentative agreement which would moderate the concessions granted the company and asked for an expression of public opinion.

It had been agreed, he said, subject to final approval on both sides, that the mill should have a capacity of 226 tons daily and cost $6,000,000. In a 310-day season payroll to full-time workers would total about $350,000 with loggers' wages approximately $575,000 yearly.

The Bowater company would be granted the right to export raw pulp equal to three quarters of the mill's capacity in addition to the 120,000 they could export under a short-term agreement now in force.

With exception of a few of the old Reid Development Company holdings, the company would be subject to income tax regulations but would be given several concessions in customs duties on equipment and construction materials.

The plan also would provide for operations in Labrador, where 3,000 miles of timber land would be leased at $2 a square mile, with royalties to be paid on the wood exported. Another clause specified that the company would contribute the cost of that part of the railway exceeding 20 miles.

The mill would be completed by December 31, 1940.

Chicoutimi Pulp Mill

Premier Duplessis, in an interview in Montreal, repeated that in late months a series of offers had been made to the Quebec Government for the reopening of the Quebec Pulp and Paper Corporation's pulp mill at Chicoutimi, which has been closed now for some five years. The mill has a capacity of 600,000 pounds of dry ground wood per day. Mr. Duplessis said that last week Messrs. Heywood and Sutherland and others, representing important Canadian interests, had discussed the matter with him.

An interesting proposition had been made to the Government. This was now being studied and he hoped would be settled shortly. It may be explained that at the last session of the Legislature an Act was passed giving the Government wide powers to enable the mill to be re-opened, there being special provision regarding the allocation and re-allocation of Crown lands for the purpose.

Seek Production of Stumpage Rates

A delegation from the New Brunswick Lumbermen's Association, headed by John E. Sayre, of Saint John, N. B., has asked the Government of New Brunswick to consider a reduction of the stumpage rates, in view of the present tense situation in the industry and the probability of the cut being heavily curtailed this season. Mr. Sayre said the curtailment of the cut of long lumber and pulpwood was partly due to the increase in the stumpage rates during the past year, as well as to increased ocean rates for lumber and increased cost of labor and supplies. The Minister of Lands and Mines, who received the delegation, said he thought the present stumpage rates were fair to the industry in comparison with other cost items entering into the operating expenses.

Mill at New Windsor Reopens

Consummation of several months of negotiation with owner William G. Shortess of Bogota, N. J., resulted in reopening of Windsor Paper Mill Inc., in New Windsor, N. Y., for the first time in about eight years.

The present small force works from 7 A. M. to 6 P. M., but with additional workers reporting next week two shifts will be in operation from 7 A. M. to 11 P. M. A 24-hour day will be effected with the full force, Treasurer Bert W. Thomas said.

Besides Mr. Thomas, William J. Cassidy, president, and Supt. William T. Cabe are in charge. They will hire New Windsor help as far as possible, and all former mill hands who sought reemployment were given jobs, Mr. Thomas said.

The three executives are well-established and well-known in the paper making industry, Mr. Thomas and Mr. Cassidy having organized the Carthage (N. Y.) Papermakers Inc. in 1932, and later holding managing positions at the Liberty mill in Steubenville, Ohio.

Buildings and machinery have been reconditioned and modernized to produce a lightweight chip and corrugating board.

New Blue Hill Text

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 15, 1937—The Tileston & Hollingsworth Company, "papermakers for more than 135 years," have mailed to printers samples of their New Blue Hill Text, illustrated in colors, one of the best watermarked antique sheets made today, because it takes the ink easily, colors as well as black, no elaborate makeready is needed, and line cuts appear to advantage and so does type matter. It is an ideal paper to have in stock for a church calendar, advertising booklet or bound book. Made by expert papermakers, it is carried in stock for direct shipment at the mill in Boston. Sizes and weights are 25 x 38—60 70 80, 32 x 44—89 104 119, 35 x 46—102 119—, and 38 x 50—120 140 160.

To Study New England Freight Rates

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., November 16, 1937—The first steps toward a united effort to study freight rate increase as they are affecting New England industries in general and local industries in particular were taken Monday when 35 representatives of local industries gathered at suggestion of John J. Kirkpatrick, manager of the gas and electric department at Hotel Holyoke to discuss the present situation.

The increased rates on coal it was pointed out would work a hardship on all industries and suggestion was made that a committee of three be named to keep in touch with the general situation and take steps to prevent any indiscriminate rating on all commodities.

H. Oliver Young traffic manager of the American Writing Paper Company was named chairman of the committee on suggestion of Manager Kirkpatrick. Other members are Mr. Robert C. Day traffic manager of the Farr Alpaca Company and John E. Lippman vice-president of the Taylor-Logan Company.

Mr. Young urged that no protest be made on the 11 per cent increase in rates on bituminous coal which becomes effective November 15. He told the audience that the present rate was $4.07 per ton and that after the 15th the rate would be $4.18 but that any protest made at this time would cause a resentment on the part of railroad officials which might react unfavorably towards the industries. The rate he said was good compared with other nearby communities. But he urged that Holyoke guard against all future rate increases.

Frank P. Kinney traffic manager of the New Haven system introduced by Manager Kirkpatrick as a friend of industry spoke on the future freight rates stating that the railroads were asking for a blanket increase on all commodities of 15 per cent and a increase of 25 cents a ton on coal; this latter to include the 11 cent increase that becomes effective the 15th.

President Robert E. Barrett of the Holyoke Water Power Company, said that the proposed 15 per cent increase would be more of burden to shoulder that the proposed 25 cent increase in coal rates. Attorney John Begley stated that the committee might act with the New England governors committee which was set up to offset any damage that might be done by a similar southern bloc.

Austria Increases Paper Production

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 10, 1937—Production of pulp and paper by Austrian mills continues to rise, according to a recent report from the office of the Commercial Attache in Vienna. Production of chemical pulp during the first 7 months of the year reached a total of 174,570 metric tons, and of mechanical pulp 57,860 metric tons, as against 143,270 tons and 45,180 tons respectively during the corresponding 7 months in 1936. Paper production during the same period rose from 99,080 tons to 135,390 tons. The production of cardboard continues to be slightly lower than a year ago, amounting to only 27,230 metric tons during the first 7 months of this year as against 29,330 tons during the corresponding period in 1936.

Kimberly-Clark Corp. Seek New Labor Ties

Cancellation of Company's Contract With Employees Independent Union Necessitates New Labor Pact—Labor Board Considers Charges Against Beloit Iron Works — Production of Casein Rises — Other Trade News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 15, 1937—In its efforts to continue the type of employer-employee relations under which it has operated successfully for so many years, Kimberly-Clark Corporation, Neenah, Wis., is using prominent advertising space in the local daily newspapers to acquaint the public with its policies. The first of a series appeared last week over the signature of S. F. Shattuck, vice-president, who explained the campaign with the statement, "For the past year the conviction has been growing that somehow the doors of Kimberly-Clark should be swung wide open to the people of this Fox River Valley."

Reference is made principally to the concellation of the company's labor contract with the recently organized Employees' Independent Union, after allegations had been made by locals of the A. F. of L. paper unions that provisions of the Wagner Labor Relations Act had been violated in forming the union. "It was a fair contract," Mr. Shattuck says, "and the officers of the union and the corporation assented to its cancellation only with deep regret."

A further statement says: "In any organization of more than four thousand people, conducted as this corporation has been conducted during the past four years, it is not surprising that entanglements lurk in the technical provisions of the Wagner Act. While for many years employees and management of Kimberly-Clark have dealt with each other through an employee representation plan, our industrial relations policies have been reborn since June 1933. Since then our management has, in no uncertain fashion, encouraged freedom of speech and the genuine sharing by employees in decisions on all matters of mutual interest. These matters of mutual interest have not been confined to minor details. They have included the matters of major importance to employees; namely, wages, hours of work, promotion, demotion, transfer, lay-off—in fact, the whole range of employer-employee relationships.

"I make this statement, with emphasis on freedom of speech, knowing intimately the attitudes of members of our management. They believe that is THE way to conduct a growing business. They have given liberally of their own time and thought to joint conferences on all manner of subjects that affect the lives and interests of men and women of this organization."

Northern Paper Mills Replaces Stack

Northern Paper Mills, Green Bay, Wis., is replacing a 260-foot steel tower carrying its power lines from its generating plants at Chalk Hills and White Rapids, on the Menominee River, because of the damage done by a freak windstorm last week. The tower is within the city of Green Bay. A 35-mile wind put such a strain on high power wires going across the Fox River that it twisted the top of the tower. The base held firm, but it buckled about 50 feet from the ground, and the upper portion turned around about 45 degrees. A. B. Hansen, general manager, said the tower would have to be entirely replaced, creating a problem as to deadening the lines and preventing interruption of navigation. The mill was obliged to shut down for three hours during the windstorm, because the gale drove water out of the Fox River and forced the level to where it fell below the intake pipes.

Labor Relations Board Considers Charges

The National Labor Relations Board has under consideration charges that the Beloit Iron Works, Beloit, Wis., discharged four members of an A. F. of L. machinists' union for union activities. A hearing was held at Beloit recently by representatives on the labor board to which company officials were summoned as well as labor witnesses. Clarence McNab, foreman, was placed on the stand and denied he had told an employee to be "damned sure to join the right union." He said foremen were instructed not to force employees in their choice of a union, nor to permit workmen to exact pressure upon fellow employees. McNab said John H. Jones, one of the four, was fired for soliciting union members during working hours.

Petitions for Larger Pulpwood Basin

In order to facilitate the growing movement of pulp wood and commercial pulp to the docks at Green Bay, Wis., for storage and reshipment to Wisconsin mills, the harbor commission of that city has petitioned the War Department to dredge a large turning basin in the Fox River near the harbor opening on Lake Michigan. Ships, especially ocean vessels bringing pulp from Europe, are inconvenienced by the present lack of facilities, the time lost in docking, and the danger of grounding. The city expects to share the cost with the government, estimated at $100,000.

Casein Production Increases 30 Per Cent

The production of casein for paper mills and other uses has shown a 30 per cent increase in Wisconsin plants during the year 1936, according to figures compiled by the Department of Agriculture. The total production in the state last year was 15,653,000 pounds, representing 34 per cent of the nation's output. Plants are now operating in all of the state's important dairy centers, especially where butter plants are located, since casein is made from skim milk. Its use in the printing of cotton cloth has grown, and the paper coating plants also are absorbing an increased supply.

Farmers Encouraged to Increase Pulpwood

Farmers in the vicinity of Marinette, Wis., are being encouraged by Charles Drewry, county agricultural agent, to plant part of their lands to timber suitable for pulp wood. Bulletins have been sent out pointing to the ready market and the dwindling supply in proximity to the mills. A selective cutting and replanting program is being urged.

Stocks In Hand Slow Down Chicago Markets

Demand for Paper Declines as Buyers Seek to Reduce Inventories to Minimum — Direct Mail Ad. Ass'n Hold Annual Meeting—Midwest Salesmen Entertain—Important Meetings to Be Held—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 15, 1937—The paper business in the Chicago area continues to be extremely quiet as far as actual sales volume is concerned. Demand is very spotty and orders are reported to be comparatively small in size, as prospective buyers pare inventories and share with general business the uncertainty over the immediate outlook. However, despite the shortage in volume, prices continue to run fairly steady and the market is firm. Specifically, the fine papers are reporting a general slowing up although the underlying market conditions continue favorable. Krafts are in only fair demand. Books and covers show no change over a week ago when the market was quiet. Groundwoods are unchanged while the newsprint market finds only the comparatively fair market situation as a point of optimism. Waste papers are dull and in little demand.

Direct Mail Ad. Ass'n Holds Annual Meeting

The Direct Mail Advertising Association held its annual Chicago showing at the Hotel Sherman during the week just past. The colorful exhibit, filling the mezzanine exhibit space of the Chicago hotel, brought to this city the circus motif and ballyhoo which has been of popular appeal during the "road trip". Attendance at the Chicago Show was good and results reported gratifying. While the Fifty Direct Mail leaders attracted considerable attention and while the exhibits from foreign lands, made the more inviting by a display of foreign flags, also drew interest, the chief magnet of attraction continued to be the individual displays of the various paper manufacturers exhibiting through their jobbers locally. The "tent shows", including Fun For Sales, Great Illusions, Thrills of Life, the Little Show and the Treasure Chest with its "Glorifying of the American Mails" were the high spots.

List of Exhibitors

Included among the exhibitors and their Chicago outlets were the following: S. D. Warren Company and the Chicago Paper Company with the comprehensive exhibit of Warren booklets; Strathmore Paper Company with its "Expression Papers" exhibited through the James White Paper Company, J. W. Butler Paper Company, Chicago Paper Company and Swigart Paper Company; Oxford Paper Company, Bermingham & Prosser and Bradner Smith & Company; International Paper Company, Bermingham & Prosser, J. W. Butler, Graham Paper Company; Midland Paper Company and Messinger Paper Company; Appleton Coated Paper Company with its Direct Sales Bond through Dwight Bros. Paper Company, Moser Paper Company, Whitaker Paper Company, Bradner Smith & Company and James White Paper Company; Gilbert Paper Company's Lancaster Bonds through Dwight Brothers, Moser Paper Company, Berkshire Paper Company, Bradner Smith & Company and Empire Paper Company; Rising Paper Company through Parker Thomas & Tucker and the Midland Paper Company, division of the Zellerbach Paper Company and the Messinger Paper Company; Nekoosa-Edwards Paper Company with its line of Nekoosa Papers handled in this area by the J. W. Butler Paper Company.

Midwest Salesmen's Assn. Entertains

The Salesmen's Association of the Paper Industry. midwest division, entertained a large number of guests at its Monday, November 8, meeting at the Hamilton Club. The occasion, which drew more than 100 salesmen and guests, was the appearance of R. U. Harmon, superintendent of Superior National Forest. Mr. Harmon, an exceptionally good speaker, discussed the timber stands in the lake states in particular, described the procedure of reforestation and outlined the methods whereby government owned land can and does produce wood for the use of the paper industry. Mr. Harmon also outlined the various woods used in the manufacturing of paper and pointed out the interest the paper industry should have in the reforestation program now under way.

Important Meetings To Be Held

Chicago is to be the site of a number of important meetings of the industry next week as this city shares with New York the privilege of entertaining bi-monthly meetings of several groups. The Sulphite Bond division of the Writing Paper Manufacturers Association with Emmett Naylor in charge, is to meet at the Drake Hotel on November 17. The Book Paper Manufacturers Association is also scheduled to meet in this city along with the Kraft Paper Association of which Mr. S. M. Hudson is the secretary.

Japan Imports More Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 10, 1937—Imports of wood pulp into Japan during the first 7 months of the current year totaled 248,000 short tons, an increase of 35 percent over the same period in 1936, according to a report from Assistant Trade Commissioner Carl H. Boehringer, Tokyo. Of this year's total 102,000 tons represents imports for paper making. According to the same report, increases in pulp for paper making were only 8.9 percent higher than last year while imports of pulp for manufacture of rayon and similar products increased by 63.8 percent.

The world shortage of pulp and the increasing demand for pulp by Japanese industrialists has served to focus increasing attention on the domestic production of pulp. The limitation of imports by means of the exchange control law has also played an important part in making the Japanese business world decidedly pulp conscious. News of new companies, plant extensions, and new and sometimes novel schemes for the production of pulp continue to receive prominence in the local press.

Thunder Bay District Plans Large Output

New Projects Will Increase Production in Thunder Bay Area to 300,000 Tons Newsprint and 260,000 Tons of Pulp—Minister of Lands and Forests Asserts Canadian Jackpine Excells Southern Pine of This Country.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 15, 1937—The Hon. Peter Heenan, Minister of Lands and Forests, states that all the mills in the Thunder Bay district are operating close to capacity and that when the new projects come into operation the district will be humming with industrial activity. The new mills, when completed, and the mills now being operated, will manufacture 300,000 tons of newsprint per annum, which, at prices of $50 per ton means $15,000,000 of new money every year. In addition, they will manufacture 260,000 tons of pulp, which, at today's average price, means another $15,000,000. The export pulpwood cut is a further revenue of $2,500,000 or a grand total of new money, most of which will remain in the district of $33,000,000 per annum. Mr. Heenan points out that all this development will entail cutting 1,150,000 cords of pulpwood each year, as compared with an annual average growth upon the areas of 2,000,000 cords. On the basis of sustained yield of our forests, this industry could be maintained in perpetuity, without impairing the value of the forests.

Advises Use of Jackpine for Pulpwood

"Your forests," said Mr. Heenan, "contain untold millions of cords of wood, and the so-called inferior species, birch, poplar, jackpine and cedar. In the Southern States our American friends have invested $100,000,000 during the last few years in plants designed for the utilization of southern pine, which my engineers tell me is not even equal in quality or quantity of yield to jackpine for paper and paperboard products.

"This side of our industry has, up to now, been utterly neglected. Our engineers are studying these problems, and in the very near future we shall have some very interesting recommendations to make to the industrial world of this continent for the utilization of our inferior species in this country."

Western Pulp Co. to Erect Mill in 1938

The Western Pulp Company, which has been granted timber rights with the intention of erecting a mill in Fort William, has agreed to commence construction by August 31, 1938, and to be in operation by the fall of 1939, it is announced by the Department of Lands and Forests in Toronto. Cutting of pulpwood by the Pulpmill Supply Company, which has taken up large areas in the vicinity of Long Lake, has already started.

Erect Dams to Extend Cutting Area

The Pulpwood Supply Company will start immediately cutting wood which will be within the area of floods by damming of waters of Long Lake. Dams are being built at the south end and north of the north end of the lake in order to divert part of the water from the James Bay watershed to flow into Lake Superior and thus make possible the floating of wood into Lake Superior for export into the United States. The Pulpwood Supply Company will begin next year, construction of a pulp mill near Schrieber, to use part of the pulpwood they will cut, and the mill is scheduled to be in operation by the fall of 1939.

Acme Box Co. Plan Warehouse Addition

Acme Paper Box Company, Ltd., 388 Carlaw Avenue, Toronto, have plans drawn for a $40,000 addition to their present warehouse and tenders for the new unit have been received. Construction work is about to begin.

Queen City Co. Purchases Building

Sale by the Sterling Trusts Corporation to the Queen City Paper Company, of Wellington Street west, Toronto, has been announced. The building is four stories and basement and stands on a lot 50 feet by 125 feet. The property is assessed at $44,000.

Fire Sweeps Consolidated Plant

Fire swept through the entire plant of the Consolidated Paper Company in Hamilton, Ont., and for a time threatened an entire business block in the city. A large amount of paper was consumed and it is estimated the loss will be over $300,000.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 17, 1937—The Government Printing Office has received the following bids for 19,638 pounds (45,000 sheets) of 100 per cent rag, white chart paper; Stanford Paper Company, 21.94 cents; Old Dominion Paper Company, 30.9 cents; Barton, Duer & Koch Paper Company, 21 cents; R. P. Andrews Paper Company, 21.63 cents; Reese & Reese, Inc., 25.24 cents; and Lee Paper Company, 23.66 cents.

For 20,000 pounds of No. 2 kraft wrapping paper in 39-inch rolls; Mathers-Lamm Paper Company, 4,275 cents; Old Dominion Paper Company, 4.41 cents; Reese & Reese, Inc., 4.18 cents; R. P. Andrews Paper Company, 4.41 cents; Enterprise Paper Company, 4.5 cents; Barton, Duer & Koch Paper Company, 4.13 cents Whitaker Paper Company, 4.18 cents; and Walker, Goulard, Plehn Company, Inc., 4.245 cents.

Uruguay Imports More Newsprint

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 10, 1937—Imports of newsprint paper into Uruguay during the year 1936 totaled 13,186 metric tons, an increase of 3,103 tons over the preceding year, according to a report from the American Consulate General at Montevideo. More than one-half of the 1936 imports came from Canada which supplied 7,351 metric tons, as against only 593 metric tons in the preceding year.

Philadelphia Awaits Better Paper Demand

Decline In Consumer Orders Creates Quieter Market For All Grades of Paper — Waste Paper Trade At Low Ebb — Paper and Cordage Association To Meet — Paper Manufacturers Co. Installs New Gum Coating

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 15, 1937.—Conditions in the paper trade as a whole during the past week were notable for their contradictory character. In our quest for information, representatives of three of the leading paper houses stated "business is fine." On the strength of this statement, reports of improvement might be made with every justification of truth. On the other hand, from representatives of two other outstanding paper houses, we learned that business is very quiet—very much retarded for this season of the year."

Waste Paper Market Very Slow

Virtual stagnation exists in the paper stock market for all grades. As conditions stood at this writing there is admitted weakness not only in mixed and common but as well in the better grades of paper stock. This drop in the waste paper market is vital to thousands of men and boys who squeeze a profit from the accumulation of waste. The opinion is advanced that the board mills are drawing on their stock for they have been definitely out of the market.

There is considerable agitation in the trade regarding the new Pennsylvania labor law to say nothing of the National Labor Relations Act. And as if these were not bothersome enough along comes the "National Wage and Hour Bill."

Paper and Cordage Assn. to Meet

E. K. Lay, president of Philadelphia Paper and Cordage Association will announce the nominee for office for the coming year at the monthly luncheon meeting on Friday, November 19th. At this meeting plans for the annual Christmas Party to a group of underprivileged children will be launched. T. W. Monteith of J. E. Fricke Company, is treasurer and can always be counted on to make this Xmas Party a huge success.

Will Introduce New Calendar Lines

For many years Garrett-Buchanan has specialized in picture calendars and calendar pads, but steps have been taken this season to broaden the scope of the department due to its constant growth. Art, humor and romance are featured in the company's new lines which are representative of practically every type of modern business.

Installs New Gum Coating Equipment

The Paper Manufacturers Company, Inc., has put into operation a new gumming machine for the manufacture of Gummed Sealing Tape, consisting of their Kraftived Brand, Perfection Flat-Gummed Papers and Perfection Gummed Teletype Rolls.

This new machine has a roll space of 54 inches, which constitutes the full width and is capable of gumming a roll 50¾ inches wide, giving a maximum of 325 feet of gummed paper per minute. It is the last word in gumming equipment, embodying all the latest mechanical improvements and devices thus enabling the production of gummed paper worthy of the name "Perfection."

This equipment is exceptional in its design and is very definitely constructed for the manufacture of flat-gummed papers. For instance, the adhesives are mixed in glass lined kettles such as are used by manufacturers of high grade dental pastes. Delicate instruments constantly control the temperature and viscosity of the adhesives to assure uniformity that Perfection Gummed Papers are renowned for.

Similarly, in the Finishing Department, special machinery for furnishing an improved printing surface enabling them to control the finish of the gummed papers, has been installed.

Improvements in the hand inspection department of this company consists of new tables and special lighting equipment, permitting the inspectors to do a more thorough and complete job. Recent added equipment and machines have doubled production on all of lines of gummed papers, manufactured by Paper Manufacturers Company, Inc.

Thomas E. Coty Gets Patent

WATERTOWN, N. Y., November 15, 1937—Thomas E. Coty, of the Coty Machine Company, has been granted a patent on his invention of a bag-making machine which covers several claims. His application for patent was filed with the government in 1934. The description of the invention is as follows: "In bag-making machines, a paste pad having two motions, one circumferentially coincident at a desired position with the path of a bag blank, the other a lateral movement transverse to said path; and means for imparting the said lateral motion at desired times."

Emeryville Mill Sold to Rushmore

The Rushmore Paper Mills, Inc., Gouverneur, N. Y., has purchased the Emeryville ground wood mill at Emeryville, N. Y., from the bondholders committee of the Oswegatchie Paper Company, it was learned here today from William G. Lewis, Jr., who with his father has had a lease on the ground wood mill for the past four years.

The Emeryville wood pulp mill is nearly 50 years old. It was built by the Gouverneur Wood Pulp Company which sold it to the Aldrich Paper Company. Later the Aldrich firm sold it to the Oswegatchie Paper Company, Inc.

German Paper Maker Ends Visit

Wilhelm Grunewald, vice-president of the Papierfabrik Sebnitz A. G., of Sebnitz, Saxony, Germany, manufacturers of newsprint and book papers, returned to Germany November 10.

Mr. Grunewald has been in this country for several weeks, during which time he has visited many of the large paper mills in this country and in Canada.

Financial News of Pulp and Paper Industry

Brown Co. Outlines Its Financial Position—Dixie-Vortex Earnings Rise — Scott Paper Co.'s Profits Up 27 Per Cent — Abitibi Bond Proposal — West Virginia To Issue First Mortgage Bonds — Other Financial News.

New York Stock Exchange

High, Low and Last for the Week Ending November 17, 1937

	High	Low	Last
Armstrong Cork Co.	44¼	40½	41½
Celotex Corp.	28¾	26½	26⅝
Celotex Corp., pf.	63	62¾	63
Certain-Teed Products Corp.	10⅛	8	9
Certain-Teed Products Corp., pf.	39	30	34½
Champion Paper & Fibre Co.	33¾	31	31
Champion Paper & Fibre Co., pf.	105⅜	105⅜	105⅜
Congoleum-Nairn Co.	27⅛	25	26⅜
Container Corp. of Amer.	17⅛	15½	15¾
Continental-Diamond Fibre Co.	11	10	10
Crown-Zellerbach Co.	14½	12¼	12¼
Crown-Zellerbach Co., pf.	78½	75¼	75¼
Flintkote Co.	20¾	17¾	18½
Robert Gair	6⅝	5⅝	6
International Paper & Power	14⅜	11½	11⅝
International Paper & Power, pf.	52⅝	45¾	46¾
Johns-Manville Corp.	86	80	81¾
Johns-Manville Corp., pf.	123	122	122
Kimberly-Clark Corp.	24½	20¼	21½
MacAndrews & Forbes	30	30	30
Masonite Corp.	35	30	31¾
Mead Corp.	16¼	14¾	15
Mead Corp., pf.	75½	73	73
Paraffine Companies, Inc.	44	40	41
Ruberoid Co.	24½	23	23½
Scott Paper Co.	39¾	37½	39¼
Sutherland Paper Co.	22	20	22
Union Bag & Paper Corp.	12⅛	10⅞	10⅞
United Paperboard Co.	7	6¼	6¼
U. S. Gypsum Co.	68	61¼	64¼

New York Curb Exchange

High, Low and Last for the Week Ending November 17, 1937

	High	Low	Last
American Box Board Co.	10¾	10⅛	10¾
Brown Co., pf.	44¼	38½	38½
Great Northern Paper	34	32¼	32½
St. Regis Paper Co.	4⅝	3¾	4¼
Taggart Corp.	6¼	5¾	5¾

Brown Co. Outlines Position

The Brown Company has mailed to its security holders, a 19-page survey of the long report on the company's present position recently filed with the court at Portland by Coverdale & Colpitts, consulting engineers. In accompanying letters, Pres. H. J. Brown states that, according to the report, Brown Company is estimated to have sustained earning power after depreciation and depletion but before fixed charges and income taxes, of $3,500,000 a year, equal to more than 2½ times interest on the present $21,415,500 bonds, and that after proposed expansion and improvements, the company should cover preferred dividend requirements by more than three times.

These estimates by President Brown are based on a compilation of prospective earnings, not published in the engineers' report but derived from several tables contained therein. Prices are based on $70 for bleached sulphite pulp, a level established for the fourth quarter of this year, and comparing with an announced price of $80 for next year.

According to the compilation, Brown Company as now constituted should earn $3,544,000 available for interest of $1,650,000 on bonds, plus accrued interest and other liabilities and for income taxes of $291,000. To the remaining $1,603,000 after these charges would be added $1,025,000 earnings from improvements at Berlin, $1,456,000 earnings from increased expansion at La Tuque, $320,000 earnings from the proposed chemical plant and $277,000 royalties to Brown Company, giving a grand total of prospective earnings of $4,681,000 a year.

On the basis of a price of $80 per ton for bleached sulphite pulp, it is estimated total earnings should reach $7,559,000, and on the basis of $60, a total of $1,359,000 is estimated.

Dixie-Vortex Earns $2.46 Per Share

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 8, 1937—Consolidated net income of $946,450.05 is reported by the Dixie-Vortex Company and subsidiaries for the twelve months ended September 30. The income reported is before audit, and after all deductions including provision for Federal and Canadian income taxes and surtaxes on undistributed profits.

On a similar basis, this compares with net income of $910,488.06 for the twelve months ended June 30, and with audited net income of $875,526.91 for the calendar year 1936.

After providing for the regular dividend of $2.50 per share on the Class A stock, the earnings available for common stock were equivalent to $2.46 per share for the twelve months ended September 30, which compares with $2.29 per share for the twelve months ended June 30, 1937, and $2.11 per share for the calendar year 1936.

Commenting on the results of operations during the twelve months ended September 30, Robert C. Fenner, president of the company, says: "We have enjoyed a good year, with sales showing a reasonable gain over last year and continuing to compare favorably with the corresponding period of 1936."

Marathon Faces Large Assessment

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 15, 1937—The Marathon Paper Mills Company is facing an increase in the assessed valuation of its tissue mill at Ashland, Wis., from $115,000 to $500,000. A protest against the consequent undue increase in taxation was made by B. H. Metternich, mill manager, during a hearing before the equalization committee of the Ashland County board. The property of the entire city of Ashland was re-evaluated recently by representatives of the Wisconsin Tax Commission. Taxpayers were told the valuations already had been accepted by the tax commission and nothing further could be done about them this year. It is possible legality of the assessment will be contested.

Scott Paper Co.'s Earnings Up 27 Per Cen

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 8, 1937 — Scott Paper Company, in the first nine months this year boosted sales 20 per cent, and earnings 27.6 per cent over the like period of 1936.

This was disclosed a few days ago in an earnings

report which placed net income at $965,233 equal to $1.69 a share on common stock, compared with $756,442 in the first nine months last year, or $1.24 a share after deduction for dividends on preferred then outstanding.

Sales for the period totaled $10,408,786 against $8,651,268 last year.

The Company said third-quarter earnings were equal to 62 cents a share on common stock, compared with 50 cents in the similar three months of 1936.

Orders booked last month exceeded the level of October, 1936 by 16.9 per cent, the company said, adding that unshipped orders October 31 last, equaled more than two weeks' manufacturing output at maximum capacity.

Philadelphia Quartz at Chemical Show

The Philadelphia Quartz Company, established in 1831, manufacturers of silicates of soda, with general offices in Philadelphia, will exhibit at the Chemical Exposition in New York, December 6 to 11, the most important of the 33 varieties, liquids, solids and powders, which they make. Silicates of soda have many properties which are not shared by other alkaline salts. Some uses are dependent upon chemical properties of the silicates. An important group of industries, including of course the fibre container, utilizes the adhesive qualities. Another general class of applications include protective or preservative coatings for wood, paper, concrete, etc. Numerous industries make use of the detergent or cleansing quality of metasilicate of soda.

A novel feature of the exhibit is a silicate use meter which will help to visualize the various fields where silicates of soda are useful.

New Financing for West Virginia

New capital financing will be resumed soon through the registration with the Securities and Exchange Commission of an issue of approximately $10,000,000 West Virginia Pulp and Paper Company first mortgage bonds, according to plans now entertained in Wall Street. Negotiations on this financing are understood to be in progress with Brown Harriman & Co., Inc., and associates.

This financing will be in the strictly new money classification, as distinguished from the refunding of high coupon callable bonds, which made up an important part of investment market operations during recent years. The issue under consideration will be the first public financing for the West Virginia company, and it is understood the funds will be applied to extinguishment of bank loans incurred for a new mill and other expansion purposes, and for promulgation of further plans of a like nature.

Allis-Chalmers Earns $3.83 Per Share

[FROM OUR REGULAR CORRESPONDENT]

MILWAUKEE, Wis., November 15, 1937—Net income of the Allis-Chalmers Manufacturing Company was $6,786,335 for the nine-month period ending September 30, according to announcement of company officials. This compares with $3,580,813 for the same period the preceding year. These 1937 earnings are equal to $3.83 a share on common stock.

I. P. Declares Dividend

The board of directors of International Paper and Power Company on Tuesday declared a regular dividend of $1.25 a share on its outstanding cumulative convertible 5 per cent preferred stock for the fourth quarter of 1937 and an additional dividend of $1.25 a share on the same stock to apply on dividend arrearages. Both dividends will be payable December 10, 1937, to holders of record at close of business November 26, 1937. Dividends on this preferred stock are cumulative from January 1, 1937.

The board of directors of International Paper Company also met Tuesday and declared a dividend of $2.50 a share on that company's outstanding cumulative 7 per cent preferred stock to apply on accumulated dividend arrearages. The dividend is payable December 10, 1937, to holders of record at the close of business November 26, 1937.

Abitibi Bond Proposal

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 15, 1937—All the many classes of security holders interested in the method and terms of reorganization of the Abitibi Power & Paper Company, with more than $80,000,000 in assets involved, had their first field day at Osgoode Hall, Toronto, last week in the Ontario Supreme Court. The receiver and General Manager, G. T. Clarkson, was on the stand and expressed the view that it is most important that reorganization on some generally acceptable plan should occur promptly. Premier Hepburn and the Minister of Lands and Forests want the matter concluded as soon as possible and it is most important that the company meet the wishes of the Ontario Government in every way possible, he said. Counsel for the liquidator and for the Bondholders' Defensive Committee and for the common shareholders argued that the Ontario Judicature Act does not apply to this company and that reorganization must proceed under the Company Creditors' Rearrangement Act, a Federal statute. The case is proceeding.

Consolidated Paper Pays Extra

The Consolidated Paper Company has declared an extra dividend of $1 a share in addition to the regular quarterly payment of 25 cents a share. The directors also voted a service bonus to all employees who have been with the company since December 31, 1936. Men employees will receive not less than $50 and women employees not less than $35. The bonus is payable on December 13.

United States Gypsum

The directors of the United States Gypsum Company have declared an extra dividend of 50 cents a share on the common stock in addition to the regular quarterly dividend of 50 cents.

Great Northern Paper To Pay Extra

The Great Northern Paper Company has declared an extra dividend of 63 cents a share in addition to the regular quarterly payment of 25 cents.

Natural Method of Drier Drainage

By A. E. Broughton[1]

The attempts to control the moisture content in a sheet of paper, from the dry or near the dry end of any paper or board machine, are wrong, right at the beginning of the idea. The damage has already been done before the correction is attempted. To rectify the damage at this point sets up a lag in the steam supply which is either overdrying or underdrying the sheet continuously.

As I have stated before, the bulk of the variations in the moisture content in a sheet of paper or board, occurring on an ordinary paper or board machine, come from variations in steam directly traceable to bad drainage conditions. There are but two methods of draining a paper machine; one is mechanical, and the other is natural. By a mechanical means, I mean all forms of forced circulation or all different schemes of manufacturing a drop in pressure in the return headers in order to maintain a flow of steam, water, and air through the dryers. By natural means, I mean a condition whereby practically the same pressure is maintained in the return header as in the driers above and eac hdrier is evacuated continuously and completely of water and air. There is but one way of doing this, in comparison to at least one hundred different ways of accomplishing mechanical drainage. In all forms of mechanical drainage, either one portion of the machine is governed by another portion or a wasterful steam condition occurs. One of the two faults, or perhaps both, is always present. In the natural method, a paper machine can be run at one pressure from end to end or can be split into any number of sections, each one independent of the other, and operating such that all of the power in the steam is used for drying and none of the power to move the steam from one section to another, and this is by far the more simple and efficient scheme of the two; i.e. mechanical or natural drainage.

[1] Presented at the meeting of the New York-Canadian Division of the American Pulp and Paper Mill Superintendents Association, Glens Falls, N. Y., Oct. 20, 1937.

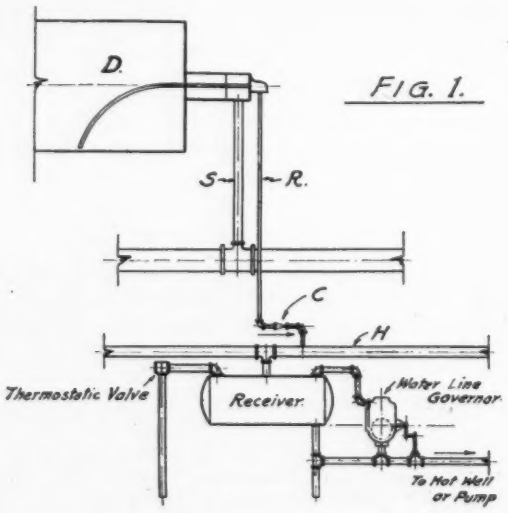


FIG. 1.

It is at the wet end of the paper machine where small variations of the steam pressure have the most effect on the drying rate of the sheet. In practically all mechanical systems of drainage it takes an appreciable time for the steam to travel through the dry end sections and into the wet end section where its real use takes effect, and this is the reason why the steam valve opens too much and closes for too long a period. There is a lag which cannot be overcome. In practically every paper mill which I visit, and where mechanical drainage is employed, I can go to the steam valve and watch it opening and closing in regular cycles, minute after minute and hour after hour. This is the wrong way to handle the steam valve. It should be opened just a trifle and closed just a trifle. In fact, the actual control valve should be on a by-pass around the main steam supply valve and a condition maintained whereby about sixty or seventy per cent of the machine requirements are maintained through one valve kept practically constant, and the other thirty or forty per cent through the control valve operated by the regulator.

The correction for drying should be made either at the wet end section alone or from the whole paper machine as a unit, with constant and complete drainage from each dryer, with fresh steam entering these dryers directly out of the steam supply header, and controlled through an accurate, easily, adjustable pressure regulator. The flow of steam to the dryers is proportioned in accordance with the drying rate required. If the sheet enters the driers a little slower or a little heavier, it will carry into the driers a little further, a little cooler. This will have a tendency to increase the condensation rate at the wet end and decrease the operating pressure. Your accurate pressure regulator steps in at this point to increase slightly the flow of steam into the driers to maintain the pressure at which it had been set and this slight increase in flow of steam is exactly equivalent to the requirements of more moisture in the paper, and your moisture content at the reel remains the same.

Natural Method Described

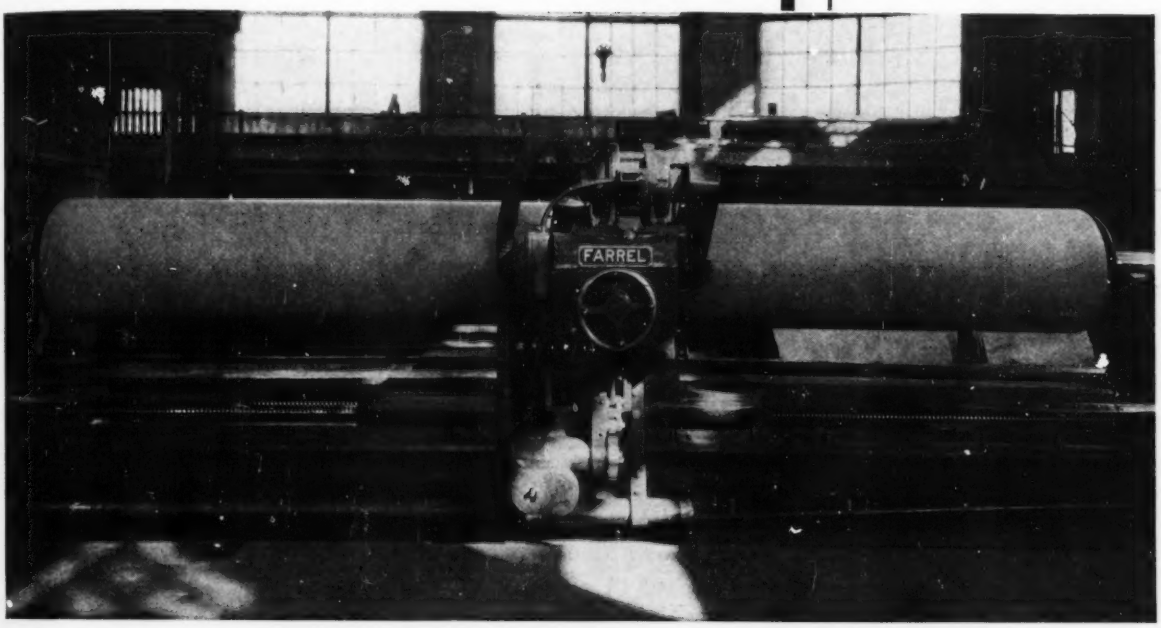
The most efficient way to use steam is to consume it completely and it is my intention briefly to describe the natural method of drainage whereby the operators at will can vary the conditions of steam into the sections f their driers without affecting the other sections.

Referring to Fig. 1, with the simple drier D, the steam inlet S and syphon return R emptying into return header H through a swing check valve C, the return header H does not need to be bigger than three inches on the largest machine made. The syphon pipe R should never be larger than one-half inch inside and outside the driers.

The largest ordinary drier, under the fastest operating conditions, will consume no more than eleven hundred pounds of steam per hour, and the average consumption in the average paper machine varies from one hundred and fifty to eight hundred pounds per hour. A syphon arrangement, sized as shown in Fig. 1, will take care of nineteen hundred pounds

THROUGH WAY BEGINS HERE

Part of the Stowe-Woodward Grinding Room showing a 241-inch rubber covered roll in a modern precision grinding machine.



Rubber covering methods and materials have been developed to the point where faultless performance can be taken for granted under practically any condition or service . . . Today, your major concern need be with prompt service and the intelligent understanding of your problems and needs . . . Stowe-Woodward offers you three generations of specialized experience in the manufacture of rubber covered rolls plus a modern, fully equipped plant capable of producing rubber covered rolls for any service in any size or quantity.

STOWE-WOODWARD, INC.

NEWTON UPPER FALLS • MASSACHUSETTS

NEW YORK OFFICE • WOOLWORTH BUILDING

Makers of WHITE STAR *Rubber Covered Rolls,* TANNITE *Couch Rolls* STONITE *Top Press and Smoothing Rolls—All by the* COREWELD *Process*

of water per hour per drier, which is more than ample.

The return header H is drained several times into a small receiver, and from this receiver, the water of condensation is carried by gravity through a water line governor, maintaining a water line at the base of the receiver and allowing the condensate to escape either to the hot-well direct or to a suitable pumping unit, but remaining sealed against the loss of steam. On the top of this return receiver are installed several large thermostatic traps of a special design. These traps will close against steam, but will remain open for air regardless of temperature.

On starting up the machine, the steam rushes in through the steam inlet S, referring to Fig 1, filling the drier from the top down. Air being much heavier, the steam immediately rises to the top and begins to push the air out through syphon pipe R into header H and into the return receiver, where it is vented direct to atmosphere through the thermostatic traps. Any water that comes out with the air, travels into this same receiver and through the water line governor to the hot-well or pump. Due to the thermostatic valve being open on the return receiver, the return header H is vented, and therefore, a condition of constant flow is maintained from the drier D into the return header H. *The check valve has disappeared as a check, being wide open, and the entrained air is escaping very rapidly.*

Finally, the steam replaces all the air in the drier and enters the syphon R and fills up the header H and its receiver. This steam, coming behind the thermostatic traps, closes them, and the header H immediately rises to the same pressure as in drier D, since its vent has been closed. The steady flow from drier D to header H ceases. Condensation, however, is occurring in drier D due to radiation and the end of the syphon pipe becomes submerged in this condensate inside the drier shutting off any possible steam from drier D to syphon R. The steam in syphon R outside the drier down to the check C is condensing due to radiation and this pipe naturally drops its pressure below that of drier D. This drop cannot be relieved from the botton through header H and the other driers in the section because of the check C which stops it. The greater pressure in drier D, than in syphon R, forces the water covering the end of syphon R up into the syphon and over the hill where it drops by gravity through the check C into header H and away. In other words, the water is being removed from drier D in little slugs. The drop in pressure in syphon R occurs so rapidly that these little slugs or cycles of drainage are occurring at least one or two times per second and, on a large machine, even oftener.

Each return slug of water that is carried up into syphon R, starts fast and then seems to slow up a little bit due to friction. When it gets over the top bend of the syphon, it seems to spread out and follow the inner periphery of the syphon pipe and due to this slowing up process, it appears to be a steady stream relieved from the drier, when it is observed in the pipe R outside the drier. *This steady stream, perhaps half the size of a lead pencil, is traveling through the check C constantly, the check opening up enough to accommodate the water running through it, check C then becoming a gradated orifice, absolutely automatic for all conditions.*

Header H, due to radiation, is having a constant tendency to decrease its pressure, and since its supply comes from the drier D, it also is doing its share to keep the evacuation moving rapidly. The pressure in this header H is at all time equivalent to that in driers D, less the energy necessary to force the water from the bottom of the syphon pipe to the top of the bend. The condensate, being under a maintained pressure, is practically at the same temperature as the steam itself and is released through the water line governor either to the hot-well or to a pump without loss of heat units.

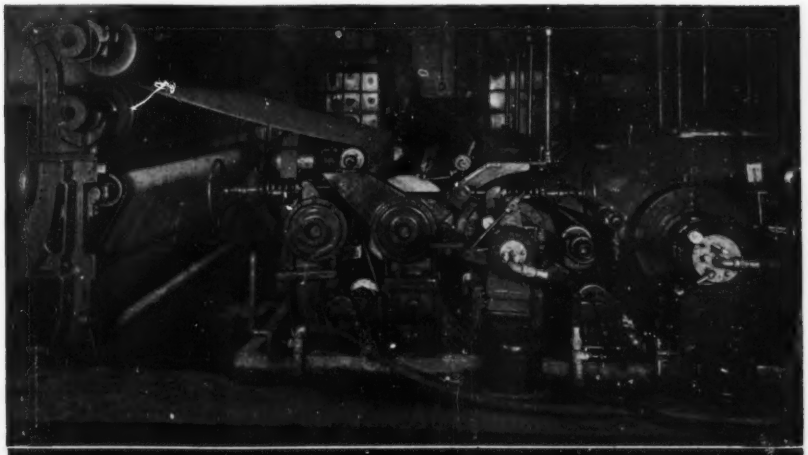
Nature Operates Completely

There has been a condition of drainage set up, that allows nature to operate completely, positively, and maintain approximately, the same pressure on the return header as in the driers themselves. Not one ounce of steam is ever allowed to escape, the air is released automatically and the water of condensation can be returned to any desired point with all of its original heat contained. Because of this very rapid air release, the largest paper machine made, equipped in this way, can be started up to full drying capacity in not to exceed thirty minutes, and all the operator has to do is turn on the steam valve. Everything else is automatic, non-depreciating and absolutely free from any mechanical difficulties. This condition will continue for the life of the machine.

It is commonly believed by paper makers that it is necessary to decrease the pressure at the wet end of paper machines in order to obtain the quality required in the sheet and in some cases this is so. We maintain that by carrying one pressure from end to end in the drier section, the gradation of temperature will be obtained through the cooling effect of the wet sheet of paper on the first few driers. This gradual control of the temperature is much more perfect than can be obtained by any attempted mechanical gradation of pressure.

New Unit-Vacuum Control System

It is following out this same scheme of individualizing control that probably directed my efforts towards the new *Unit Vacuum Control System* which is becoming so popular for the control of the flat boxes under the wire of any Fourdrinier paper machine. It has been, and still is on a great many paper machines, a practice to empty the flat boxes into one suction header and, if control of the flat boxes, particularly at the wet end is necessary, to throttle both the water and air leaving the box. The moment this is done, a condition is set up determining very definitely how much water can be taken from that box and the operators must immediately control to the right amount, the water into the screens, such that a correct amount is being drained out of the wet boxes ahead of the dandy to form just the right conditions under the dandy. This is a delicate adjustment and one which is subject to very quick changes as freeness and weights vary. By individualizing the control of these boxes and separating the water and air in such a manner that whatever vacuum is required on any box does not affect the vacuum on any other, sets up a condition where the box outlet runs wide open and less vacuum and less water removal from the wet end boxes is governed by the difference in pressure between the top of the wire and inside the box. These boxes therefore run

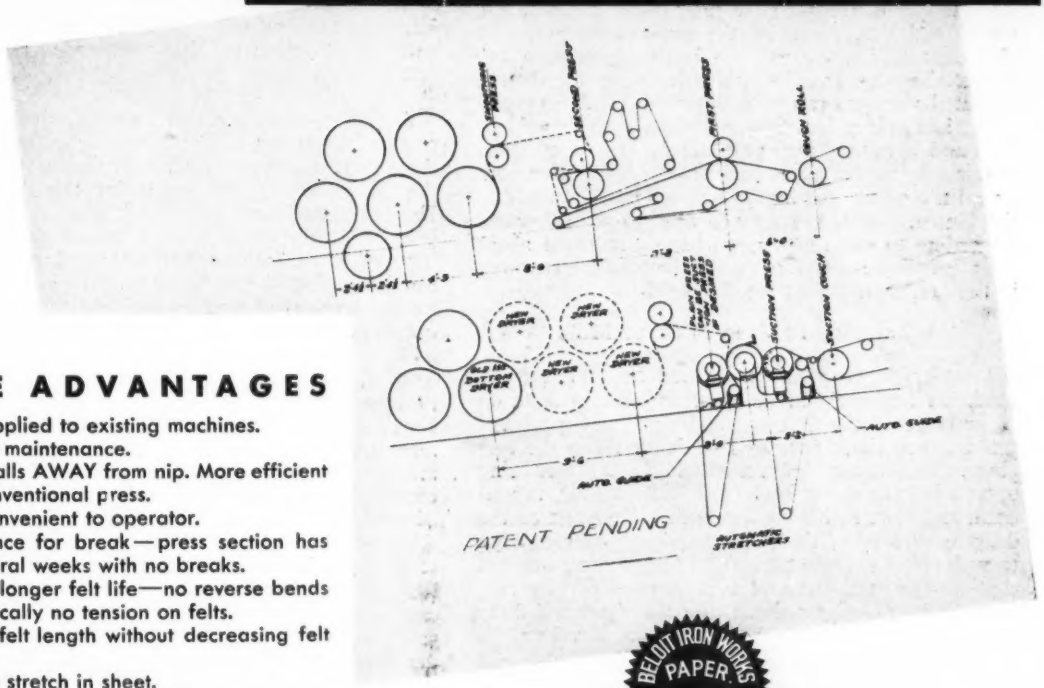


Better Different NEW

BELOIT HORIZONTAL

PAT. APPLIED FOR.

DUAL PRESS



SOME ADVANTAGES

1 Easily applied to existing machines.
2 Reduces maintenance.
3 Water falls AWAY from nip. More efficient than conventional press.
4 More convenient to operator.
5 No chance for break—press section has run several weeks with no breaks.
6 Assures longer felt life—no reverse bends—practically no tension on felts.
7 Shorter felt length without decreasing felt life.
8 Reduces stretch in sheet.
9 Unnecessary to carry a large amount of crown.
10 Paper goes to dryers more bone dry.
11 Saves enough space to permit use of more dryers, or to lengthen fourdrinier wire part.
12 Eliminates crushes.
13 Smooths out sheet without need of reverse press.
14 Increases speed and safety.

Many other advantages. Write for details.

BELOIT IRON WORKS • BELOIT, WISCONSIN

BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS., U.S.A.

THE BELOIT WAY IS THE MODERN WAY

empty, and small changes in freeness and weights carrying more or less water down to these boxes, have no effect on the amount of water carried under the dandy as the boxes have plenty of extra capacity to take care of the extra water. It is universally true where this individualized box control is set up, that the operators can decrease the consistency in the head box, run much more water in the paper, and carry a much heavier puddle under the dandy without any effect of fingering or crushing. All of you well realize what a benefit this is to formation.

It has also been the practice in the past, with the usual type of suction headers, to vent these headers and allow air into the vacuum pump in amounts necessary to decrease the vacuum on the pump to a point required on the boxes. This amount of air allowed into the suction header is usually a great deal more than the air actually traveling through the boxes and therefore rather large vacuum pumps were necessary. By individualizing the box controls through a type of controller that sets up a condition automatically of just the amount of vacuum the operators want on that box, by either pulling a trifle from the suction header or by allowing air down into that box only, means that no air is necessary to be added to the suction header and therefore the quantity of air necessary for the pump to handle has been enormously decreased. In fact, it was found three or four years ago that it was unnecessary to operate the flat box vacuum pumps at all and they were totally eliminated; the load being taken by the couch and sometimes by the press vacuum pump without affecting the vacuum holding power to any appreciable degree. By individualizing the boxes, gradated vacuums can be maintained which, in many cases, has a very beneficial effect on both two-sidedness and wire-marking; particularly in colored stock is this very useful. I have installed this system now on a little over three hundred paper machines within the United States and Canada and many in Europe. According to our records, we have eliminated about three hundred vacuum pumps and a total horsepower in the neighborhood of ten thousand.

What May be Seen in Same Mills

I walk into so many mills and see a miserable condition beginning in its most aggravated state on the surface of the first wet end drier and gradually petering out about four or five driers down the machine. The doctor blades are there, but are not being operated. The dryer surface is badly coated, roughened, and must be having a deteriorating effect on the delicate surface of the sheet of paper you are going to such pains to make smooth. If the doctors are run continuously, the dirt and fuzz scraped off the surface of the drier gets down into the sheet and dirty paper, plus many other bad situations, develops.

About twelve years ago, I had a proposition put up to me, in a mill in northern Maine, to try and solve this condition of dirt and scale at the wet end of the paper machine, if the doctors were run continuously. I began experimenting with some type of hood down over the doctor blade and through which a column of air was carried into a suction fan on the back side of the machine. Further experiments along this line showed me that this hood must be made flexible, such that in the event of paper break at this drier, the paper piling up on the doctor blade would either push the hood back out of the way or would set up a condition where the hood automatically would come back. Again, after a period of trial, I found that the hood, if properly counterbalanced, could be held down by stops to a point just off the drier surface by the actual vacuums set up under the hood and with the air traveling rapidly through it. This idea was finally on the right track and, after continued experiments over an extended period of time, a collector system was developed that was apparently foolproof in operation and very simple to install. Only a small portion of the fuzz and scale skinned off the drier by the doctor blade lies on the doctor blade and can be seen. The larger portion of these particles shoot off the blade radially into the air, part collect on the upper machine felt, part go into the sheet traveling to the upper drier, and of course part into the machine room. The effect of this flexible hood over the doctor blade and a column of air traveling from the wide open end at the front is to collect all of the fuzz and scale which would automatically collect on the blade, and all of these fine particles which have been shooting up into the air. The amount that the discharge fan would deposit in a small collecting room over a period of twenty-four hours was astonishing. Furthermore, it was found that eliminating these particles traveling back into the machine felt and into the rising sheet practically eliminated the carryover from the first drier into the second, and from the second into the third, etc., and the paper machine cleaned itself up. This is in explanation of our contention that one collector on the first met end drier is usually all that is necessary to clean up the entire paper machine.

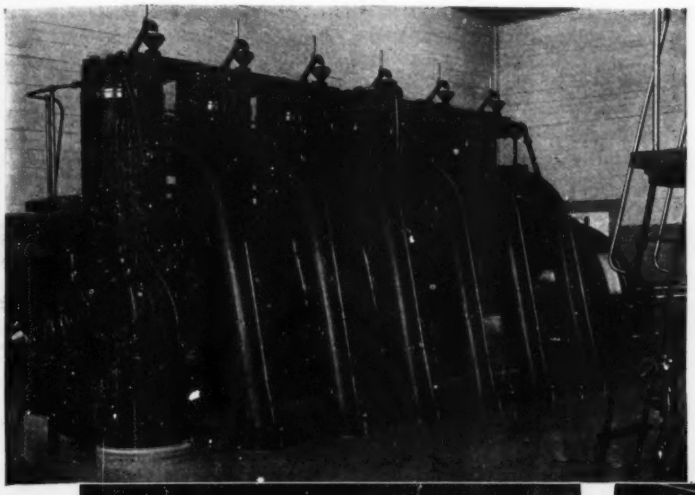
Some Collectors Built in 1931

A few of these collectors were built in 1931 and some of them are still in operation, although two or three were taken out after a period of trial because the fibers would ball up under the doctor blade. Further experiments in this direction were not made, because of the well-known effect of the depression, but we knew what was the matter and that the trouble could be solved by oscillation of the whole fuzz collecting unit. But how to oscillate this was another question. Any form of known oscillator was too bulky to be installed on the front end of the machine. You all well know how the machine tender dislikes to have anything installed on the front of his driers. Furthermore, the type of oscillators then on the market were too expensive. I tried out electrical and mechanical oscillators, to no avail, and came to the conclusion that the only oscillator which could be adapted at this point of the machine must be something small, compact, and without any gears, chains, levers, or visible operating mechanisms whatsoever. The answer to this problem, after a long period of experimentation, was the development of our new small and compact vacuum oscillator, operating from the vacuum supply of the suction couch or custion press pump. A small oscillator of this description, our size "E", has a maximum diameter of six and one-half inches and is about five inches long. Yet, this little machine, with fifteen inches of vacuum behind it through a one-eighth inch pipe, will deliver a push in excess of two hundred pounds. The use of this new vacuum oscillator with the fuzz collector has finally eliminated all the "bugs" in this new idea and it is now practical for operation on any drier over which it can be installed.

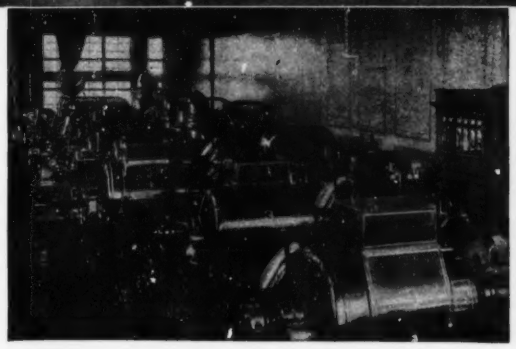
Of course the vacuum oscillator has a great many

THREE FACTS

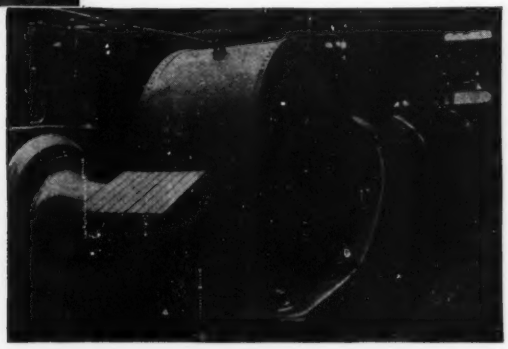
THAT POINT *ONE WAY*



DIESELS . . . *more Diesel h.p. in this country is lubricated with Texaco than with any other brand.* No product offered Diesel operators has equalled the popularity of the Texaco Ursa series of oils for Diesel cylinder lubrication.



TURBINES . . . *large central stations the world over* use Texaco Regal Oils in their turbines. Turbine builders the world over highly recommend these highest grade turbine lubricants.



RECIPROCATING ENGINES . . . *this 12,500 b.p. Reciprocating Engine* is Texaco-lubricated 100%. It runs a blooming mill in the plant that rolls the largest steel plates in the world.

HARD-BOILED power plant operators don't continue using a lubricant, unless that lubricant backs them up, eases their day's work, keeps their engines efficient.

Hundreds of power plants use nothing but Texaco . . . have used no other brand for many years. They KNOW that Texaco Lubricants do their job.

Trained lubrication engineers are available for consultation on the selection and application of Texaco Products. Prompt deliveries assured through 2070 warehouse plants located throughout the United States.

Call in a Texaco representative. Find out what Texaco can mean to you in improved operation.

The Texas Company, 135 East 42nd Street, New York City.

TEXACO

TEXACO *LUBRICANTS*

FOR ALL TYPES OF ENGINES

other positions of use besides the fuzz collector, such as calender stack doctors, plain drier doctors, smoothing press doctors, wire stretch roll doctors, head box side oscillating showers, open end dandy showers, and many other places. The largest size oscillator is size "E", and requires considerably less than one cubic foot of air per minute at fifteen inches of vacuum. The pull from the couch or press vacuum pump of a number of these oscillators is negligible.

Immediately we ran into a miserable bearing situation when we installed our oscillators, and particularly on press roll doctors. We have again solved the problem to facilitate the general use of our Oscillators by including, where necessary, antifriction bearings that will make the duty of the oscillators to push and pull the doctor blade and not simply to try to move the doctor blade shafts in the ordinary inefficient saddle bearings now in general use.

Paper Industry of Northwest

A report entitled "The Pulp and Paper Industry of the Pacific Northwest" has just been issued by the office of the Division Engineer, North Pacific Division, U. S. Engineer Department. This report has been prepared, with the assistance of the U. S. Forest Service and the Research Department of the Portland Chamber of Commerce, and deals with the possibilities of marketing Bonneville power through expansion of the pulp and paper industry throughout the Pacific Northwest.

The report has been mimeographed in three volumes. Volume I, consisting of 170 pages, with 6 illustrations, is the main report, and includes a full discussion of the industry, its present status with respect to other sections of the United States and Canada, and a study of transportation costs on newsprint and woodpulp. The economic factors of production, with a discussion of possibilities, are given in this part of the report, followed by a summary and conclusions covering the report as a whole.

Volume II contains 81 pages and 10 illustrations and charts, covering the pulpwood resources of the Columbia River area. Volumes, by areas, ownership and availability, are tabulated and discussed with relation to the possible utilization for further expansion of the pulp and paper industry.

Volume III is a comprehensive statistical study, with 143 pages and 7 illustrations, covering the industry of the United States, with special reference to the Northwest. Included is a two-color map of the Douglas Fir Region showing the location of the pulpwood types.

Copies of the report can be obtained at the U. S. Engineer Office, 523 Pittock Block, Portland, Oregon, at a price of 75 cents per volume.

Self-Sealed Bearings

A new 20-page booklet entitled "Sealed" gives the principles involved in the N-D-Seal bearing, and the need for this type of self-sealed bearing. Numerous case histories are cited and illustrated in which N-D-Seals have been used with outstanding success. A review is given of accomplishments of this self-seal lubricated-for-life ball bearing after ten years, during which time 10 million have been placed in successful use.

Those interested should ask for "Booklet D" from New Departure, Division General Motors Corporation, Bristol, Conn.

To Build Reservoir in Cedar River

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., November 15, 1937—Paper manufacturers of this section are interested in plans under way by the Hudson River Regulating Board for construction of a reservoir to be created by a huge dam on the Cedar River, a few miles above the confluence of the Cedar and Hudson Rivers. When constructed the reservoir will have an area of 5,000 acres and will be approximately one-fifth the size of the Sacandaga Reservoir. It is estimated that the cost will be approximately $2,500,000. The proposed reservoir is one of several proposed in the general plan heretofore adopted by the Regulating Board for the regulation of the Hudson River, the Sacandaga Reservoir being the first and only one so far constructed. The latter was built by the state at an estimated cost of $12,000,000 and has already proven of great benefit to paper mills in the Hudson Valley by eliminating lost-time periods during drought seasons. It is understood that the construction of the proposed reservoir will have a marked effect upon the regulation of Hudson River in the way of flood control and incidentally will increase the flow of the river during low water periods to the advantage of the owners of the power sites below the dam.

Papermaking at Rockefeller Center

On the 38th floor of the International Building in Rockefeller there is in operation a small-scale paper mill for making paper by hand. The plant is under the supervision of Harrison Elliott with accessories furnished by Japan Paper Company. It is one of the exhibits of The New York Times Book Fair. Robert Robertson, formerly of England, an old-time hand papermaker and a descendant of a papermaking family where the art has been handed down as a heritage from father to son through generations, is making the paper sheet by sheet on a small hand mould and demonstrating the general principle of papermaking. It is one of the educational exhibits which constantly draws a group of interested spectators.

The small plant has an international flavor as the equipment originally came from Eynsford Mill, Kent, England, a company of papermakers established in 1699. The all-rag pulp used is supplied by W. C. Hamilton & Sons, Miquon, Pa. Each sheet made bears the watermark of Japan Paper Company, an American concern and distributors of European, Oriental and domestic papers.

Czechoslovakia Concludes Cartel

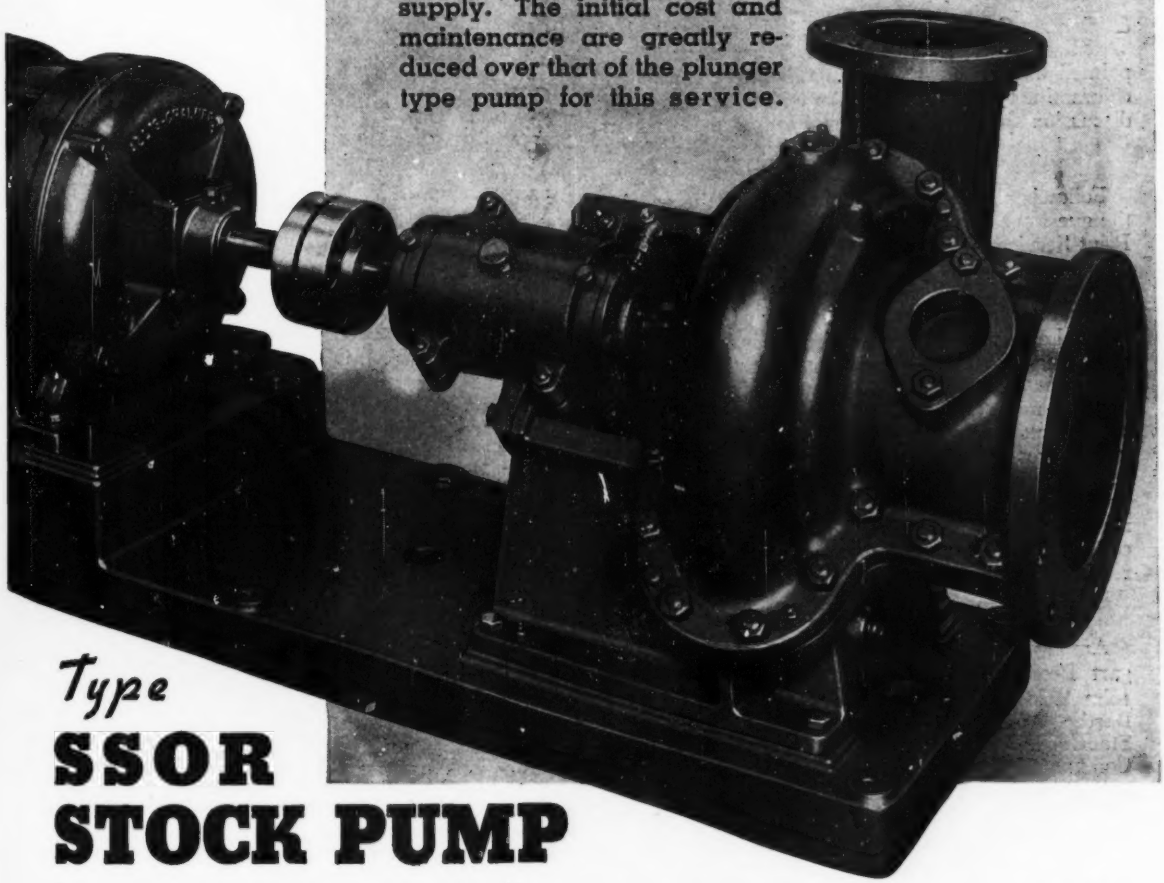
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 10, 1937—A cartel agreement governing sales, sales quotas, prices and sales terms of wrapping paper and paper bags in Czechoslovakia was concluded by 88 Czechoslovak producers of these products, according to a report from the office of the Commercial Attache at Prague. The agreement, which was signed on May 25, 1937, was entered in the Cartel Register on September 9, 1937, under No. 1078/1 and is to remain valid until December 31, 1941. If none of the signatories gives notice six months prior to expiration of the agreement, its validity will be extended automatically for successive two year periods.

Extending the USE

THE TYPE SSOR open impeller pump developed in 1926 for handling paper stock has again been improved. A larger suction permits the handling of heavier consistency stock at higher efficiency.

A special impeller has been designed with such characteristics that there is very little change in capacity for changes in head which extends the use of the SSOR pump to paper machine head box supply. The initial cost and maintenance are greatly reduced over that of the plunger type pump for this service.



Type SSOR STOCK PUMP

ALLIS-CHALMERS ENGINEERED

787

Electric generators, transformers, converters, rectifiers, switchgear and regulators — Electric motors for all purposes — Texrope Drives.

Steam engines, steam turbines and condensers — Water wheels and accessories — Blowers, compressors and vacuum pumps — Centrifugal pumps.

Farm and Industrial Tractors — Farm machinery — Flour, feed and flaking mill, sawmill and timber preserving machinery — Mining, metallurgical and hoisting equipment.

EQUIPMENT ENGINEERS TO INDUSTRY

ALLIS-CHALMERS

MILWAUKEE WISCONSIN

TAPPI INSPECTS NEW SYRACUSE LABORATORY

(Continued from page 11)

laboratory with all of its unusual facilities for research will make a still larger contribution to the science of pulp and paper manufacture.

Symposium on Paper Mill Sanitation

Under the chairmanship of Ronald Bensen of the National Paper Products Company, Carthage, N. Y., the meeting was opened, and the first paper was by J. R. Sanborn of the New York State Agricultural Experimental Station, Geneva, N. Y., who talked on "Microbiological Problems in Pulp and Paper Manufacture." In this paper Dr. Sanborn featured the necessity of producing a paper as sterile as possible for food container uses. He described the various kinds of slime bacteria, fungus and yeast present in mill supply and white water.

The second speaker was A. E. Griffin of Wallace & Tiernan Company, Newark, N. J., who talked on "Application of Chloramine for Slime Control" and pointed out his experience in utilizing chlorine and chloramine to remove slime. An extensive round table discussion followed the presentation of these papers.

Southern Pine Pulping

Following a well attended banquet in the evening, the guest speaker, W. G. MacNaughton of the News Print Service Bureau, New York, gave an interesting address on "Southern Pine for Groundwood and Newsprint." In this talk Mr. MacNaughton reviewed his experience as Technical Director of the Pulp and Paper Laboratory of Savannah in grinding wood and preparing newsprint. He pointed out that newsprint from Southern pine had been successfully run at the Thorold mill of the Ontario Paper Company and had been printed commercially in several Southern newspaper presses. Although the sheet was somewhat soft and raggy it was otherwise satisfactory. He pointed out, however, that anyone entering into commercial manufacture should expect to have to do a considerable amount of experimenting before being reasonably able to make a satisfactory sheet.

Those in Attendance

Among those present were: C. E. Apelgren, Taggart Brothers, Oswego, N. Y.; Douglass Bartow, John A. Manning Paper Company, Troy, N. Y.; J. C. Barthel, American Cyanamid and Chemical Company, Stamford, Conn.; W. E. Beazley, International Paper Company, Palmer, N. Y.; A. O. Bragg, Diamond Alkali Company; F. G. Calkin, Solvay Process Company, Syracuse, N. Y.; R. A. Campbell, U. S. Gypsum Company, Oakfield, N. Y., H. P. Cannon, Upson Company, Lockport, N. Y.; Ferri Casciani, Electro Bleaching Gas Co., Niagara Falls, N. Y.; W. A. Chilson, Hooker Electrochemical Company, Niagara Falls, N. Y.; Mr. and Mrs. K. P. Coachman, Taylor Instrument Company, Schenectady, N. Y.; W. F. Connolly, West Carthage, N. Y.; J. D. Dickson, Jr., R. T. Vanderbilt Company., E. Norwalk, Conn.; B. W. Ellis, Buffalo Pumps Inc., Buffalo, N. Y.; C. E. Foster, Oswego Falls Corporation, Fulton, N. Y.; J. D. Gaffney, Solvay Process Company, Syracuse, N. Y.; Ives Gehring, Oswego Falls Corporation, Fulton, N. Y.; L. A. Gideon, Spaulding Fibre Company, Tonawanda, N. Y.; F. C. Goodwill, St. Regis Paper Company, Deferiet, N. Y.; Mr. and Mrs. E. W. Gutliph, Brownville Board Company, Brownville, N. Y.; E. G. Ham, John A. Manning Paper Company, Troy, N. Y.; F. L. Harrington, Cottrell Paper Company, Rock City Falls, N. Y.; W. E. Hess, Solvay Sales Corporation, Syracuse, N. Y.; W. O. Hisey, N. Y. College of Forestry, Syracuse, N. Y.; F. Hoar, Solvay Process Company, Syracuse, N. Y.; Paul Hooker, Hooker Electrochemical Company, Niagara Falls, N. Y.; D. A. Hunter, Berst-Forster-Dixfield, Plattsburgh, N. Y.; F. R. Hyatt, Johns-Manville Corporation, Syracuse, N. Y.; C. J. Jonson, Lockport, N. Y.; E. J. Johnstone, Lockport Felt Company, Newfane, N. Y.; A. B. Julin, Dexter Sulphite and Paper Company, Dexter, N. Y.; J. D. Kane, Flower City Tissue Mills, Rochester, N. Y.; Jack Kelly, Victoria Paper Mills, Fulton, N. Y.; Earl Knapp, Dexter Sulphite Pulp and Paper Company, Dexter, N. Y.; E. S. Lansing, Bagley and Sewall Company, Watertown, N. Y.; C. E. Libby, N. Y. S. College of Forestry, Syracuse, N. Y.; A. A. Lowe, Sandy Hill Iron & Brass Company, Hudson Falls, N. Y.; R. G. Macdonald, Secretary of TAPPI, New York, N. Y.; M. J. Maguire, Hercules Powder Company, Lockport, N. Y.; R. T. Mann and Keith Mann, Foster Paper Company, Utica, N. Y.; J. Manse, U. S. Gypsum Company, Oakfield, N. Y.; M. M. Meacham, Beaver Wood Fibre Company, Thorold, Ont.; Mr. and Mrs. H. T. Murphey, Stebbins Engineering and Manufacturing Company, Watertown, N. Y.; S. C. Nagle, Hooker Electrochemical Company, Niagara Falls, N. Y.; W. J. O'Brien, O'Brien Steam Specialty Company, Syracuse, N. Y.; G. F. Onfrey, Syracuse, N. Y.; F. W. O'Neil, N. Y. S. College of Forestry, Syracuse, N. Y.; G. E. Osterheldt, Krebs Pigment and Color Corporation, Newark, N. J.; L. J. Peck, Wallace & Tiernan Company, Newark, N. J.; F. C. Peterson, N. Y. S. College of Forestry, Syracuse, N. Y.; M. W. Phelps, Solvay Process Company, Syracuse, N. Y.; J. H. Rich, Newton Falls Paper Co., Newton Falls, N. Y.; W. H. Roberts, Jr., Hooker Electrochemical Company, Niagara Falls, N. Y.; E. M. Root, Dilts Machine Co., Fulton, N. Y.; C. H. Sawyer, Smith-Lee Company, Inc., Oneida, N. Y.; John Schuber, Solvay Process Co., Syracuse, N. Y.; D. R. Seip, Johns-Manville, Oswego, N. Y.; D. M. Shapleigh, Hercules Powder Company, Albany, N. Y.; Philip Silverman, O'Brien Steam Specialty Company, Syracuse N. Y.; A. P. Tracy, John A. Manning Paper Company, Troy, N. Y.; Frederick Waite, Stebbins Engineering and Manufacturing Company, Watertown N. Y.; W. J. Walker, Johns-Manville, Oswego, N. Y.; D. B. Williams, Williams Apparatus Company, Watertown, N. Y.; F. M. Williams, same company; S. J. Weinberg, Upson Company, Lockport, N. Y.; R. I. Wynne-Roberts, Norton Company, Niagara Falls, N. Y.

Irving Carton Machinery Sold

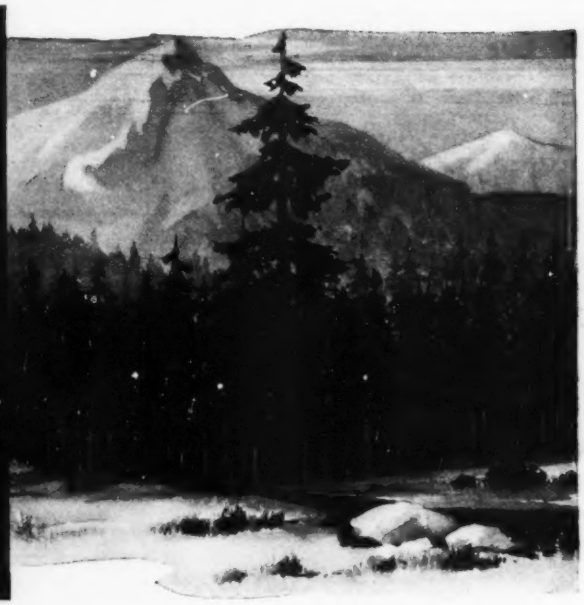
[FROM OUR REGULAR CORRESPONDENT]

SALEM, Mass., November 15, 1937—An auction of machinery of the Irving Carton Company was held Wednesday. The Sam Cohen Machine Corporation, 123 Greene Street, New York, N. Y., bought most of the machinery.

Always *One* Is Outstanding

•

In Paper Pigments It Is *Titanox-A*



AMONG paper fillers, Titanox-A is the monarch of the forest, the Taj Mahal in architecture, the Sterling mark in silver. Its fine characteristics of opacity, whiteness and brightness distinguish it as the leader.

Whitest of the white pigments, greatest in hiding power, Titanox-A (Titanium Dioxide) gives desired results with minimum pigmentation in papers suitable for stock certificates, bonds, legal documents, ledgers and similar long-life sheets. Time cannot dim their whiteness and brilliance.

The uniformity, extreme fineness and easy dispersion of Titanox-A make for exceptional workability. Chemically inert, it will not react with other constituents of the paper or affect the fiber in any respect.

Our Service Department will be glad to furnish more detailed information and technical advice on the use of Titanox pigments.

TITANIUM PIGMENT CORPORATION

Sole Sales Agent

111 Broadway, New York, N. Y.; Carondelet Station, St. Louis, Missouri; National Lead Company (Pacific Coast Branch), 2240 24th Street, San Francisco, California.

TITANOX
REG. U.S. PAT. OFF.

•

Titanox-A is the master pigment for light-weight papers. Where higher loading is permissible we recommend Titanox-B and B-30 (Titanium Barium Pigments).

•

TITANOX-A

TRADE MARK
(TITANIUM DIOXIDE)

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills

General Construction News

Chattanooga, Tenn.—The O. B. Andrews Company, Roosevelt avenue, manufacturer of paper box board, folding box board, news board, etc., has plans maturing for new one-story addition to mill, totaling about 45,000 square feet of floor space. New unit is reported to cost over $75,000, including equipment. Work is scheduled to begin soon. The R. H. Hunt Company, Chattanooga Bank Building, Chattanooga, is architect.

Minox, Pa.—The United States Corrugated Fibre Box Company, 1409 Roosevelt avenue, Indianapolis, Ind., manufacturer of corrugated boxes and containers, has preliminary plans under way for new branch plant in Clarion County, vicinity of Minox, to be one-story, 60 x 200 feet, reported to cost over $60,000, including equipment. Proposed to begin work early in 1938. H. J. Lacy is president.

Elkhart, Ind.—The Continental Diamond Fibre Company, manufacturer of insulating papers, fiber products, etc., has approved plans for one-story addition to steam power plant on South Campbell street, Elkhart, to be used for local branch mill. General erection contract has been awarded to the Smith-Nuppanau Company, Elkhart, and for brick chimney to the Continental Chimney Company, 127 North Dearborn street, Chicago, Ill. Work will be placed under way at once. Cost close to $40,000, with equipment. Main offices of company are at Newark, Del.

San Francisco, Cal.—The Field-Ernst Envelope Company, 45 Fremont street, manufacturer of commercial envelopes and kindred paper products, has work nearing completion on new two-story paper-converting plant at Fifth and Tehama streets, previously referred to in these columns, 80 x 275 feet, and will have the structure ready for occupancy in near future. Sub-contracts are being let for completion work, including millwork to the Brannan Street Planing Mill, 560 Brannan street, and for finish hardware to the Palace Hardware Company, 581 Market street, both San Francisco. Cahill Brothers, Inc., 206 Sansome street, San Francisco, is general contractor. New unit will cost about $120,000, including equipment. Day & Michelson, 405 Montgomery street, San Francisco, are architects.

Covington, Ky.—The Triangle Paper Bag Manufacturing Company, 1301-23 Madison avenue, manufacturer of paper bags and containers, has approved plans for new one-story addition, adjoining present plant, and will carry out erection by day labor. It will be 30 x 200 feet, and used primarily for storage and distribution. Cost estimated over $40,000, with equipment.

Enka, N. C.—The American Enka Corporation, Enka, near Asheville, manufacturer of cellulose rayon products has asked bids on general contract for new addition to mill, to be one-story, reported to cost over $60,000, with equipment. Superstructure will be placed under way in December. Main offices of company are at 271 Church street, New York, N. Y.

Philadelphia, Pa.—The Camden Fibre Mills, Inc., Hancock street and Columbia avenue, manufacturer of fiber products, has arranged for the purchase of property now occupied at location noted, comprising a four-story structure on site, 108 x 191 feet, and similarly, for the acquisition of a five-story industrial building on adjoining site, 56 x 120 feet, at Second and Turner streets. The property heretofore has been held by the Hancock Street Corporation and will be developed by purchasing company for fiber products manufacture.

Chicago, Ill.—The Isgo Wall Paper Corporation, 2115 West 21st, street, has work under way on new two-story and basement addition to storage and distributing plant, 50 x 124 feet, recently referred to in these columns, and will push the erection to early completion. New unit will provide considerable increase in present facilities. It is estimated to cost about $45,000, with equipment. Dubin & Dubin, 127 North Dearborn street, Chicago, are architects.

Niles, Mich.—The Niles Waste Paper Company has approved plans for new addition to plant, to be one-story, used for general operating and office service. Erection contract has been awarded to Williams Brothers, Niles, and work will be placed under way at once. New structure is reported to cost about $25,000, with equipment.

Putney, Vt.—Fire recently damaged a portion of the local mill of the Vassas Paper Company. An official estimate of loss has not been announced. Plans for early rebuilding are under consideration.

Poughkeepsie, N. Y.—The Western Printing and Lithographing Company, 1220 Mound avenue, Racine, Wis., manufacturer of paper specialties, has awarded miscellaneous contracts for new steam power house at branch paper-converting plant at Poughkeepsie. The structure will be built by day labor and work will be placed under way at once. An award for chimney has been let to the Custodis Chimney Company, 135 William street, New York, N. Y. Conveyors will be furnished by the Gifford-Wood Company, Hill street, Hudson, N. Y. Awards for other equipment will be placed soon. As re-

THERE GOES A WISE MAN

. . . he relies on Cincinnati Roll Covers for trouble-free performance

When the end of a busy day comes, this paper mill executive, like those from 152 other important paper mills, leaves his plant knowing that the shifts that work on through the night won't have trouble with rubber covered rolls.

In his mill, "Cincinnati" is the standard replacement covering for table, press, suction, couch and squeeze rolls. He knows that Cincinnati Rubber Roll Covers hold the crown, that they have a uniform density and that every square inch of a Cincinnati Cover is made to give 100% dependable service.

Why not send your next roll to Cincinnati for recovering?

THE CINCINNATI RUBBER MANUFACTURING COMPANY
CINCINNATI, OHIO

CINCINNATI
RUBBER COVERED ROLLS

cently noted in these columns, new unit will cost close to $50,000, with equipment.

Waynesboro, Va.—E. I. duPont deNemours & Company, Rayon Division, duPont Building, Wilmington, Del., manufacturer of acetate rayon products, has begun an expansion and improvement program at mill at Waynesboro, to include several new one and multi-story units for expansion in storage and distributing divisions and other departments. A new steam power plant will be built. Entire project will be carried out over a period of months and is reported to cost in excess of $2,000,000, with equipment.

Birmingham, Ala.—The Birmingham Paper Company, Fifth avenue South and 21st street, manufacturer of commercial paper products, has active erection under way on new three-story and basement addition to paper converting plant, recently referred to in these columns, and proposes to have the structure ready for ocupancy at early date. It will be 100 x 190 feet, and will provide for large expension in output, including a division for manufacture of corrugated boxes and containers, as well as departments for commercial envelopes, school pads and allied specialties. Cost is estimated close to $175,000, including equipment. The Southern Construction Company, 611-15 South 11th street, is general contractor; Charles H. McCauley, Jackson Building, is architect, both Birmingham.

Doncaster, England—Elleurite Containers, Ltd., Doncaster, manufacturer of corrugated paper and other containers, has plans maturing for new plant on local site, comprising one and multi-story units, estimated to cost close to $400,000, including equipment

Brisbane, Australia—The Colonial Sugar Refining Company, Ltd., has arranged for the construction of a new addition at one of its large mills in the North Queensland district, to be used for the production of fiber board materials for insulating and lining service, a new branch of manufacture for the company. Waste from sugar cane, known as Bagassa, will be used for raw material. Plant will consist of several units and will be equipped for large capacity. Further expansion in this line is proposed by the company, with erection of additional plant units in the future. Present project will represent an investment reported in excess of $200,000.

Wurttemberg, Germany—The Swabian Cellulose and Staple Fibre Company, Ltd., Wurttemberg, recently organized, has plans maturing for construction of a new mill in the vicinity of Wurttemberg, where large tract of land has been secured. Plant will consist of several one and multi-story units, to be given over to the manufacture of cellulose, using beechwood, available in large quantity in that area, as source of raw material. Project will include a power house, pumping station and other mechanical structures. It will be equipped for an initial output of about 20,000 tons per annum and is scheduled for completion before the end of 1938; erection will begin early in that year. At a later date, the company will begin the construction of a mill for the production of staple fiber on neighboring site, to be equipped for a capacity of about 10,000 tons per annum, and will operate in conjunction with the cellulose mill. Entire project is estimated to cost in excess of $1,000,000.

Obituary

William P. Wagner

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 15, 1937—William P. Wagner, president of the Northern Paper Mills, Green Bay, Wis., for the past thirty years, died in his sleep of heart disease Friday night, November 12. Mr. Wagner was aged 78 years. He was the cofounder of the Northern Paper Mills in 1901. He served as vice-president until 1907 when he became president of the company. He built the Northern Paper Mills to one of the largest tissue mills in the world. He resigned as president of the Citizens National Bank of Green Bay six years ago to devote his full time to the duties of the presidency of the Northern Paper Mills.

Samuel Whedon

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 15, 1937—Samuel Whedon, who was secretary of the Tuttle Press Company, Appleton, Wis., until his retirement about 15 years ago, died last week at his home in Hollywood, Calif., at the age of 77 years. He had been ill for about a year. He came to Appleton in 1902 to associate himself with the company. He was prominent in local activities, especially in the Elks lodge. The survivors include the widow and two daughters, Mrs. Gustave J. Keller of Appleton, and Mrs. Edith Rice, Hollywood, Calif., and one son, Vyse, also of Hollywood. Burial took place at Hollywood.

Newsprint Production Increases

Production of newsprint in Canada during October 1937 amounted to 314,594 tons and shipments to 322,661 tons, according to News Print Service Bureau Production in the United States was 78,352 tons and shipments 72,127 tons, making a total United States and Canadian newsprint production of 392,946 tons and shipments of 394,788 tons. During October 28,638 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 421,584 tons. Total production in October 1936 was 412,849 tons.

The Canadian mills produced 440,181 tons more in the first ten months of 1937 than in the first ten months of 1936, which was an increase of sixteen and nine tenths per cent. The output in the United States was 23,527 tons or three and one tenths per cent more than in the first ten months of 1936, and in Newfoundland 27,292 tons or ten per cent more, making a total increase of 491,000 tons, or thirteen and five tenths per cent.

Stocks of newsprint paper at the end of October were reported at 81,317 tons at Canadian mills and 27,692 tons at United States mills, making a combined total of 109,009 tons compared with 110,851 tons on September 30, 1937.

To Be Hamilton Agent

W. C. Hamilton & Sons, Miquon, Mont. Co., Pa., have appointed the Central Ohio Paper Company of Cleveland, Ohio, as agent for Hamilton Bond, Hamilton Ledger and Hamilton Mimeopen Bond.

GET THE LION'S SHARE

—with Orange Y

Use Heller & Merz dyes and make sure of getting the lion's share of satisfactory results from your dyeing operations.

Orange Y is one of the most extensively used Acid colors. Its brilliant shade, excellent solubility and economy make it suitable for all types of coloring—beater, calender, dipping and coating.

It is equally suitable for the production of high grade papers as well as the cheaper ground wood papers. It is extensively used in the production of salmon, mandarin tans and browns in poster, cover, boxboard, leatherboard, wrapping paper and sheathing papers.

H & M DYES ARE BETTER BUYS

Heller & Merz

DIVISION OF THE CALCO CHEMICAL CO., Inc. 90 WEST STREET, NEW YORK, N. Y.

• • • A DIVISION OF AMERICAN CYANAMID CO.

BOSTON—35 Hartford St. • CHICAGO—146 W. Kinzie St. • SPRINGFIELD, MASS.—40 Albert St. • PHILADELPHIA—401 No. Broad St.

FACTORIES: BOUND BROOK, N. J. AND NEWARK, N. J.

PAPER TRADE
ESTABLISHED 1872
JOURNAL

Reg. U. S. Pat. Off.

George S. Macdonald, Pres. *Joseph P. Horgan, Secy.*
Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Price, Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CV New York, November 18, 1937 No. 21

COMING EVENTS IN THE PAPER INDUSTRY

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

PERIL OF WAGE AND HOUR LEGISLATION

"In its attempt to put a floor under wage rates, the Black-Connery Bill can succeed only in bringing down the ceiling of annual incomes and labor's yearly purchasing power," according to business economists Allen W. Rucker and N. W. Pickering in their latest study of the industrial situation. The study is published in booklet form by Farrel-Birmingham Company, Inc., Ansonia, Conn., under the title, "The Peril of Wage and Hour Legislation."

"Whatever the intention of its sponsors," Messrs. Rucker and Pickering point out, "the Black-Connery Bill is the first step toward the levelling down of wage rate differentials and a return to the equalized subsistence standards of medieval Europe . . . a road to ruin already being tramped by Europe's millions now under regimented economies. If the way is opened for Federal control of minimum wage rates it is opened for Federal control of all wage rates . . . and their ultimate levelling down by fiat here tomorrow as in Europe today."

It is both interesting and significant the authors assert to note that in 1933, the year in which Federal legislation succeeded in arbitrarily raising average hourly wage rates by well over 10 per cent, the percentage share accorded labor actually shrank. And that in 1935, when that legislation was nullified by the Supreme Court, the percentage share actually increased.

Most significant, however, is the fact that labor's share of industrial income tends to be uniform and almost constant, regardless of what either industry, labor or government does. Natural forces, deeply embedded in the economic structure, cannot be changed by arbitrary legislation without courting disaster both to industry and its employees.

Thus, in 1935, when labor's percentage share was increased, the purchasing power of the average annual income diminished. This is ample reason to suspect that attempts to cut labor a bigger slice of the pie may always be accompanied by a shrinkage in the size of the pie.

The suspicion is confirmed by the events of the summer and early fall of 1937, wherein arbitrary advances in industrial costs arising from wage agreements have served to unbalance price relationships and to restrict both marketable output and wage incomes. The attempt to cut larger slices from the pie has caused the size of the pie to shrink.

Viewed in its proper light as a work restriction, production restriction and market restriction measure similar to the agricultural act, the Black-Connery Bill can serve only to intensify these evils. By clogging the markets, it must produce just what agricultural restriction has produced, an unmanageable surplus of labor comparable to the surplus of cotton and other commodities. And that outcome must call for huge relief appropriations to finance unmarketable labor just as the agricultural program now calls for huge appropriations to finance crops which cannot be marketed at an artificial price above world levels.

A considered estimate shows that a 40 cent hourly minimum wage may well serve to increase the average hourly wage rate in industry to 70 cents or more per hour. In such event, the limitation upon payrolls set by farm income would reduce the man-hours of work given by industry by some 800 million hours and result in the dis-employment of upwards of 600,000 wage earners. The accompanying inflation of industrial costs and prices would, of course, substantially curtail the marketability of output, the annual incomes of wage earners, and the purchasing power of both labor and farmers alike.

The mis-use of the differential hourly wage rate the authors say is easily the greatest economic tragedy of modern times. That device, useful to society in rewarding individual merit and skill according to its relative worth, has never been and cannot be used to lift the total income of all labor. In every country and period in which that has been tried, the failure has been decisive. In the United States, the attempt in the Railroad and Coal Mining Industries, as well as others, served only to reduce the purchasing power of labor and to enforce a permanent, large-scale unemployment, even during the period

of prosperity, 1923 to 1929. Similar effects upon all industrial labor are visible from like attempts during 1933 to 1937.

The Black-Connery Bill like its predecessors, will, in the attempt to put a floor under wage rates, succeed only in bringing down the ceiling of annual incomes and labor's yearly purchasing power.

And in the restriction of work, production and the marketability of industrial goods, it can result only in a condition comparable to that which has followed the past ten years of crop restrictions and crop marketability.

The real objective of the nation, the authors maintain, is a progressively larger *goods* income, regardless of the monetary price tag thereon. It is not a progressively larger dollar income, without regard for the accompanying shrinkage in goods and the standard of living of wage earners. Russia, Germany, France, Italy and Japan have all tried in recent years the expedient of increasing monetary incomes regardless of goods incomes. And each in turn has been compelled by its people to discard price and wage inflation and resort again to expanding production as the one road to plenty.

The study is a new approach to the wage problem in that it points out, perhaps for the first time, that there are four meanings to the term "wages" instead of merely one. The authors discuss the Black-Connery Bill in connection with the differential wage rate, the average annual dollar income, the purchasing power of the dollar income and labor's percentage share of industrial income. Among the official statistics cited by the authors are tables showing that the nation-wide attempt in 1930 and 1931 to maintain wage rates did not succeed in maintaining annual income and that the N.R.A. program, while raising wage rates, resulted in a decline in the purchasing power of average annual incomes because of the resulting higher prices. Significantly, none of these moves succeeded in increasing factory labor's share of industrial income.

Cost Finding Committee Meets

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 15, 1937—A well attended luncheon meeting of the Cost Finding Committee of wrapping paper merchants of Boston and vicinity was held Friday at the Boston Chamber of Commerce, with Harry J. Dowd presiding. Current market conditions were thoroughly discussed. Satisfaction was expressed over the firmness generally prevailing in cost prices of commodities dealt in. Merchants as a whole seem to be in a favorable position in regard to kraft stocks. Some new buying is in evidence.

These fortnightly meetings are open to any members of the wrapping paper trade and offer a valuable means of exchanging views on current market conditions.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	90.3% (c)	76.1%	65.8%	.....
February	90.1% (c)	77.9%	70.0%	.....
March	90.3% (c)	76.0%	70.5%	.....
April	92.1% (c)	82.3%	70.0%	.....
May	90.6% (c)	81.6%	69.4%	.....
June	87.3% (c)	80.7%	72.3%	.....
July	81.8% (c)	77.3%	64.9%	.....
August	82.9% (c)	81.5%	70.9%	.....
September	78.7% (c)	80.5%	71.9%	58.2%
October	73.8% (c)	87.6%	75.6%	64.7%
November	.....	88.0%	75.3%	61.7%
December	.....	85.9%	71.2%	59.6%
Year Average	.....	81.3%	70.5%	.....
Year to Date First 44 weeks	85.2%	80.2%	70.1%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1937		CORRESPONDING WEEKS, 1936	
*October 2	79.2%	October 3	85.3%
*October 9	77.1%	October 10	87.1%
*October 16	74.9%	October 17	87.6%
*October 23	73.9%	October 24	88.2%
*October 30	69.3%	October 31	89.7%
*November 6	60.9%	November 7	87.0%

The following statistics show the number of mills reporting by ratio groups:

NUMBER OF MILLS REPORTING, CURRENT WEEKS

Radio Limits	Oct. 2 1937	Oct. 9 1937	Oct. 16 1937	Oct. 23 1937	Oct. 30 1937	Nov. 6 1937
0% to 50%	88	94	113	101	93	97
51% to 100%	227	221	199	210	205	152
Total Mills Reporting	315	315	312	311	298	249

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Months	1937	1936	1935	1934
Jan.	80% (e)	61%	61%	—
Feb.	86% (e)	67%	67%	—
March	87% (e)	68%	67%	—
April	89% (e)	70%	61%	—
May	86% (e)	68%	61%	—
June	75% (e)	68%	65%	—
July	67% (e)	69%	59%	—
August	74% (e)	75%	65%	—
Sept.	70% (e)	76%	69%	62%
Oct.	—	82%	76%	63%
Nov.	—	79%	70%	56%
Dec.	—	74%	60%	52%

Week ending Oct. 2, 1937—71%
Week ending Oct. 9, 1937—67%
Week ending Oct. 16, 1937—68%
Week ending Oct. 23, 1937—64%
Week ending Oct. 30, 1937—62%
Week ending Nov. 6, 1937—56%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Prospects Bright on Coast

Ward R. Howard, vice president and sales manager of the Howard Paper Company and its allied companies, the Maxwell Paper Company, of Franklin, Ohio, the Aetna Paper Company of Dayton, Ohio, and Dayton Envelope Company, Dayton, Ohio, is on an extended trip to the northwest and the west Coast, contacting distributors for the Howard allied Mills. Mr. Howard reports prospects for the future very bright on the Coast and the sales of paper and envelopes as holding up satisfactorily.

T. S. Nichols Made Vice President

Thomas S. Nichols became a vice president of Prior Chemical Corporation, New York, on November 15. Mr. Nichols is a native of Cambridge, Md., and his chemical career started in 1926 in the operating department of DuPont's Lithopone, Dry Color and Pigment Division at Newark, N. J. Since 1928 he has held responsible sales positions with the DuPont Company at Philadelphia and New York.

SALES GO UP . . . WITH HIGHER DOLLAR VALUES

CYANAMID RESEARCH PRODUCES MORE EFFICIENT

WAX SIZES

Cyanamid has spent much labor and research in the development of finer wax sizes for the paper industry. Among the most important of these is 5C ALWAX SIZE, a product that is not only more efficient but better in color and easier to handle than former sizes.

All Cyanamid sizes, of which there is a complete line, are made with special care and under complete chemical control to assure the utmost in quality and uniformity.

You are invited to take advantage of Cyanamid's efficient technical cooperation in keeping your quality up and your cost down. Our representatives will be glad to discuss your problems.

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Adhesives

Importance of Adhesives in Practical Package Manufacture. Frank K. Greenwald. Shears 55, No. 531:55-56 (March, 1937).—The choice of a proper adhesive is not only important for maintaining the schedules of output but also for insuring the effectiveness of the package after it is sent into the field. Simple rules are given for obtaining perfect results, such as care of materials, correct storing, upkeep of machinery, and selection of weight and type of paper suitable for the surface to which it is to be applied. Special reference is made to problems offered by lacquered paper, foil paper, and transparent tissues. A humidifier and desiccator are suggested for duplicating either tropical or very dry climate conditions; by subjecting a package to these simple tests it can be quickly determined how it will stand up under adverse climatic conditions.—C.J.W.

Paste Making Equipment and Procedure in Stein-Hall Starch Adhesive Method. Shears 55, No. 530: 69-70 (Feb., 1937). A brief description of the paste making and feeding equipment used in the Stein-Hall starch adhesive method is given. It is advisable to treat each installation as an individual case. The best method of supplying the adhesive to the machines has been found to be a continuously circulating system which overflows through the paste boxes of the machines.—C.J.W.

Mechanical Process

Efficiency of the Defibering Process and Soviet Grinder Stones. M. I. Koifman. Bumazhnaya Prom. 15, No. 7-8: 85-91 (July-Aug., 1936); C. A. 31: 2421.—The results of factory experience show that Soviet quartz-cement stones are more durable and gives a better grade of groundwood pulp at a greater efficiency and a reduction of about 15% of energy consumption as compared with foreign stones. Further improvements in the construction and use of stones are suggested.—C.J.W.

Quality of Soviet Grinder Stones. A. P. Bendryshev and A. D. Shapiro. Bumazhnaya Prom. 15, No. 10:26-32 (Oct., 1936); C. A. 31:2421.—The five-year development of the manufacture of quartz-cement stones in the U. S. S. R. is reviewed. The excellent performance of the late models is confirmed. Substitution of carborundum and emery for quartz sand, requiring further study, for the production of brown groundwood gave good results.—C.J.W.

Increased Defibering (mechanical pulp) Output for High-speed Paper Machines. V. A. Sakharov. Bumazhnaya Prom. 15, No. 6: 20-34; No. 7-8: 63-76 (June-Aug., 1936); C. A. 31: 2421.—A comprehensive discussion of all important phases of defibering wood for high-speed newsprint is based on laboratory and factory experiments and literature. It deals with the problems of producing high-grade mechanical pulp at an increased rate of defibering and decreased cost.—C.J.W.

Use of Alkali in the Production of Mechanical Wood Pulp. A. I. Samyshkina. Bumazhnaya Prom. 15, No. 10: 72-74 (Oct., 1936); C. A. 31: 2421.—The use of 0.0015 per cent of sodium hydroxide in the circulating water reduced the energy consumption by about 100 kw. hours per ton of mechanical pulp, increased slightly the productivity of the equipment and improved considerably the tensile strength of the paper.—C.J.W.

Ground Wood from Pine Wood. M. Martynoff and J. D. Weiss. Zellstoff u. Papier 17, No. 3: 102-03 (March, 1937). At the Kondopoga paper mills a process was used for making ground wood from pine wood, the results of the test are tabulated. The process consists essentially of treating the wood with 1 to 2 per cent soda at a temperature of 80° C, thus putting the rosin in solution. From the quality viewpoint; the ground wood prepared from treated pine wood is in many respects inferior to that prepared from spruce wood.—J.F.O.

Groundwood Studies. III. An Investigation of Process Variables Using a Miniature Pulp Grinder. J. Edwards, G. D. O. Jones, G. J. C. Potter and H. Wyatt Johnston. Pulp Paper Mag. Can. 38: 121-132 (1937).—Investigations were carried out on a 2 x 12 in. miniature one-pocket grinder with swinging pocket loaded by deadweight and reading direct friction drag. Speed, temperature and consistency produced little effect on unit energy consumption and pulp properties. Pressure decreased burst ratio and unit energy consumption and increased freeness and fiber length. Production was proportionate to speed

and increased more rapidly with respect to pressure. Thermal balances for the grinding process showed that practically all the energy expended in grinding is converted into sensible heat. It is possible that a combination of dull stone faces with high pressures leads to higher freenesses for given burst ratios and to lower unit energy consumption for a pulp of definite properties.—A.P.-C.

The History of the Pulpwood Grinder. D. M. Waterous. Pulp Paper Mag. Can. 38: 116-120 (1937).—A.P.-C.

The Grinding of Jack Pine for News Print Manufacture. H. A. Paterson. Pulp Paper Mag. Can. 38: 146-147 (1937).—A brief description of practices that have proved successful in the commercial grinding of jack pine for news print.—A.P.-C.

Alkaline Processes

Concerning the Chlorination of Plant Substances. O. A. Muller and F. Stalder. Papier-Fab. 35, No. 1: 8-14 (Jan. 8, 1937). The action of chlorine gas on plant fibers, especially spruce, beech, straw and flax are studied quantitatively and qualitatively with special attention to the consumption of chlorine gas. Detailed description of the experimental procedure together with tables and many references to the literature.—J.F.O.

Pulp Manufacture. Raymond F. Remler assignor to E. I. du Pont de Nemours & Co. U. S. pat. 2,068,-1515 (Jan. 19, 1937).—Straw and other non-resinous materials are cooked with an alkaline liquor containing a small amount of turpentine.—A..-C.

Producing Fibrous Cellulose from Plant Stalks. George A. Lowry and Jim R. Grant. U. S. pat. 2,064,929 (Dec. 22, 1936).—Flax straw is subjected to a mechanical scutching which removes about 70 to 75% of non-fibrous material. The two thus obtained are rapidly digested with water at or near the boiling-point and then cooked for about 3 hrs. at 320° to 360° F. with a 10% caustic soda solution.—A.P.-C.

Digestion of Fibrous or Cellular Material. De la Roza Corp. Brit. pat. 457,524 (May 27, 1935).—Cellulosic material is compacted so as to remove the contained air, the removal being assisted by pre-impregnation with a liquid such as milk of lime, or by forcing a liquid therethrough while compacting. It is then digested in absence of oxygen with hot liquor under pressure and the volatile products are continuously removed. An apparatus is claimed.—A.P.-C.

Treatment of Vegetable Fibrous Material for Production or Cellulose Fiber or Pulp. F. R. Chesley, Jr. Brit. pat. 457,171 (June 3, 1937).—In the production of alpha-pulp, coniferous woods or grasses, after reducing in size by chipping, etc., are boiled in aqueous solutions containing about 719 lb. of of trisodium phosphate, 62.5 lb. of soda ash, and either 7.8 lb. of aluminum sulphate or 23.3 oz. of finely-divided metallic aluminum per 10,000 lb. of water. The pulp is washed and the process may be repeated for a shorter time, followed, if necessary, by treatment with a wax solvent and (or) a bleaching agent.—A.P.-C

Practical Aspects of Recent Kraft Mill Developments. D. G. Moon. Paper Trade J. 104, No. 8: 103-106 (Feb. 25, 1937).—A general discussion.—A.P.-C.

Digesting Method and Apparatus. Joaquin Julio de la Roza, Sr., assignor to de la Roza Corp. U. S. pat. 2,072,086 (March 2, 1937).—In order to prevent "blow-back" of the contents of a continuous digester, the invention provides a shut off means between the charging hopper and the digesting zone, together with means for constantly testing the density or compactness of the advancing closure plug of charging material, the construction being such that when the density falls below a predetermined point the closure means is automatically operated. The arrangement operates to open the closure means when the density again reaches a predetermined point.—A.P.-C.

Production of Pulp. Francis H. Snyder, assignor to Snyder Maclaren Processes, Inc. U. S. pat. 2,072,487 (March 2, 1937).—Cellulosic material is boiled in a conventional pulp cooking liquor in which is dissolved a minor porportion of a "non-carboxylic organic detergent" of the formula M.X.R, in which M is hydrogen or an alkali-forming metal, X is an acid radical to which may be linked both an alkyl group and hydrogen or an alkali-forming metal, and R is an alkyl group. The function of this "detergent" is to increase very considerably the penetration of the cooking chemicals into the fibrous material under treatment.—A.P.-C.

Black Liquors

Dry Distillation and Pressure Heating of Black Liquor. Hilding Bergstroem, K. N. Cederquist and K. G. Trobeck. Evensk Pappers-Tidn. 40, No. 3: 52-54 (Feb. 15, 1937).—The formation of volatile liquid products which were obtained by dry distillation of black liquor from the sulfite process in the presence of calcium oxide, calcium formate, and calcium carbonate has been studied. By dry distillation of black liquor with calcium oxide, 15 per cent of the organic matter was converted into oil and water-soluble products. A dry distillation combined with previous pressure heating with lime increased the yield to almost 30 per cent. The pressure heating yielded 10.2 per cent, and the following dry distillation 18.1 per cent.—C.J.W.

Dependence of the Heat Requirement of an Evaporator Plant upon the Initial and Final Concentration of the Black Liquor. Finnish Paper and Timber J. 18, No. 18: 876, 878, 904-906 (Sept. 30, 1936).—The heat requirement of multiple stage evaporators is usually calculated from the mean value of the steam or heat requirement per ton of evaporated water as referred to the number of evaporating units. The authors do not consider this procedure suitable for obtaining the correct fundamentals on which to base the calculation for additional costs arising from evaporating to a higher consistency or starting at a lower initial temperature. They show by calculations how conditions, especially the heat requirement, are affected when the initial or final concentration is changed. The heat requirement is not in proportion to the quantity of water evaporated.—C.J.W.

Recovery of Waste Products at the Lobov Solombal'sk Sulphate Pulp Mill. G. S. Kovalevich. Bumazhnaya Prom. 15, No. 10: 20-26 (Oct., 1936); C. A. 31: 2422.—Discussion of the methods of recovery of waste products is begun with a description, with mathematical treatment, of the installation and performance of the Scott (English) vacuum evaporators for recovery of sulphate black liquor.—C.J.W.

Black Liquor Recovery. Philippe Plancquaert. Fr. pat. 801,853.—Black liquor is discharged into a

vessel containing a magnesium phenolate (preferably cresolate). When the reaction is completed, the precipitated complex magnesium salts are separated, and the solution is treated with magnesia to liberate caustic soda and regenerate the magnesium phenolate. —A.P.-C.

Removing Fluorides from Water. Ralph H. McKee and William S. Johnston. U. S. pat. 2,072,376 (March 2, 1937).—Water contaminated with fluorides is acidified and brought into contact with activated black ash residue from the recovery of black liquor, activation consisting essentially in treatment with a 0.1 per cent hydrochloric acid solution. A carbon made by heating organic materials with alkali and allowing the acidified water itself to activate the carbon also gives satisfactory results.—A.P.-C.

Manufacture and Refinement of Chemical Pulps and Regeneration of the Spent Chemical Liquors. Hugh K. Moore, assignor to Brown Co. U. S. pat. 2,072,177 (March 2, 1937).—In the recovery of sulphate black liquors causticization of the solution is performed as heretofore with lime insofar as possible, and is completed by the use of barium sulphide and (or) barium hydroxide; the barium sulphate and (or) barium carbonate precipitate is separated and recovered by reducing in a kiln in presence of finely divided carbon or carbonaceous material. According to another phase of the invention the make-up sodium sulphate, instead of being added to the concentrated spent liquor before smelting, is converted into sodium sulphide by metathetical reaction with barium sulphide, and is then added to the lime-causticized solution of the smelted compounds to produce a cooking liquor of desired composition. Where the production of kraft pulp is carried on simultaneously with pulp-purifying operations wherein alkaline liquors of the same general composition as kraft cooking liquors are used, the dilute spent refining liquor is substantially completely rid of its organic matter by adding thereto the ground reaction products obtained in the recovery of the barium sulphate and (or) carbonate, in the form of a concentrated slurry containing barium sulphide and (or) hydroxide in amount greatly in excess of that theoretically necessary to convert the inactive chemicals present in the spent refining liquor.—A.P.-C.

Treatment of Black Liquor. George H. Tomlinson. U. S. pat. 2,070,632 (Feb. 16, 1937).—Concentrated black liquor is introduced in the upper region of a vertical stack furnace as a coarse spray directed against one of the furnace walls, the conditions being regulated so that substantially all the water is evaporated before the particles reach the wall towards which they are projected. The substantially dry particles adhere to it and build up into a plastic spongy cake which falls in lumps to the bottom where combustion proceeds with great rapidity.—A.P.-C.

Sulphite Process

The Ion Concentrations in Strong Sulphite Pulps. III. Carl Du Rietz. Svensk Kem. Tid. 49, No. 2: 52-65 (Feb., 1937).—Du Rietz discusses the theory, the method, and the practical application of the determination of the ion concentrations in strong sulphite pulp.—C.J.W.

The Dissolution of Lignosulphonic Acid in Sulphite Pulp by Means of Methanol. Carl Kullgren. Svensk Kem. Tid. 49, No. 2: 65-75 (Feb., 1937).—The dissolving out of the solid lignosulphonic acid from a hard sulfite pulp by means of methanol with and without hydrochloric acid is investigated. The results show that the hydrogen ion concentration of the solid lignosulphonic acid is sufficient to bring about a dissolving of the lignin. The dissolution of the acid is accompanied by an increase of the methoxyl content. This increase is caused by an alcoholysis.—C.J.W.

The Dissolution of Lignosulphonic Acid in the Sulphite Cooking Process. Erik Hägglund and Göte Sävö. Svensk Pappers-Tidn. 40, No. 2: 23-27 (Jan. 31, 1937).—In order to answer the question as to whether the dissolution of the solid lignosulphonic acid is a hydrolytic process, a series of experiments were carried out to study the ratio of dissolution. These results show that the hydrogen ions, which are effective within the solid phase, are important for the dissolution process, thus indicating that this process is due to a hydrolysis catalytically effected by hydrogen ions. From the constancy of the reaction constants of this process it is concluded that the lignosulphonic acid residues are of uniform molecular size. It is also probable that these lignosulphonic acids are not polyvalent compounds but monobasic sulphonic acids of low molecular weight. In the solid phase and in solution lignosulphonic acid shows a strong tendency to condense with the formation of larger complexes.—C.J.W.

Adaptation of the Sulphite Cooking Process to the Intensive Operation of the Forests. Leif Grogaard. Papier-Fabr. 35, No. 3: 17-22 (Jan. 15, 1937).—In order for the logs to have few knots, it is necessary that the trees are allowed to grow fairly close to each other. The yield of the same quality of pulp is considerably less from fast growing trees than from slow growing. The question of barking by hand in the forests or by machinery at the mill is discussed at full, and also wet versus dry chips in its effect on the cooking process and the finished quality. —J.F.O.

Process of Digesting Sulphite Pulp. Sjune Svensson. U. S. pat. 2,073,776 (March 2, 1937).—In the circulation system of Svensson's U. S. pat. 1,981,759, of Nov. 20, 1934, the injector does not operate completely effectively until the digesting liquid has reached a temperature of about 70° to 80° C. This is overcome by supplying steam at or near the bottom of the circulation pipe in the early stages of digestion, so that the liquor reaches the jet at a temperature of 70° to 80° C.—A.P.-C.

Treatment of Cellulosic Materials. Henry Dreyfus. U. S. pat. 2,069,943 (Feb. 9, 1937).—Pulp suitable for the production of cellulose acetate is obtained by cooking wood successively with a caustic alkali solution of 1 per cent to 5 per cent concentration, and with an acid solution of sulphur dioxide, both treatments being carried out under pressure at a temperature of 100° to 180° C.—A.P.-C.

A Simplified Method for the Analysis of Bisulphite Cooking Liquor. Donald T. Jackson and John L. Parsons. Paper Trade J. 104, No. 8: 122, 124 (Feb. 25, 1937).—Pipette 5 cc. of the liquor into a 250 cc. erlenmeyer flask containing 10 cc. distilled water, 5 cc. of starch-iodide solution and 4 drops of methy red indicator; titrate with 0.3125 × normal sodium chlorite to the appearance of a persistent blue color, cc. × 0.2 = g. total sulphur dioxide per 100 cc. Discharge the blue color with 1 drop of 2.5 per cent sodium thiosulphate solution (not necessary if organic

substances are present) and titrate with 0.3125 × normal sodium hydroxide solution to the methyl red end point (red to yellow), cc × 0.2 = g. free sulphur dioxide per 100 cc. The results are in excellent agreement with those of the iodate method (Palmrose *Paper Trade J.* 100, No. 3: 38-39 (Jan. 17, 1935)). —A.P.-C.

Studies in the System Calcium Oxide-Sulphur Dioxide-Water. III. Precipitation Temperatures. P. E. Gishler and O. Maass. Can. J. Research 13B: 370-379 (1935).—A technic is described for measuring the precipitation temperatures of the system calcium oxide-sulphur dioxide-water, and the results over a considerable concentration range are tabulated. It is shown that the presence of colloidal matter brings about a condition of supersaturation. The hydrogen ion and bisulphite ion concentrations for the solutions at the precipitation temperature are calculated. It is suggested that the hydrogen-ion concentration plays an important role in precipitation, and the copious nature of the precipitation with rising temperature above the precipitation temperature is explained. A table containing bisulphite ion concentrations over a large range of calcium oxide and sulphur dioxide concentrations, and over the temperature range 50° to 90° C. is given. It is pointed out that the system calcium oxide-sulphur dioxide-water acts as a buffer solution so far as bisulphite ions are concerned.—A.P.-C.

A Possibility in the Sulphite Pulping of Jack Pine. O. Brauns. Pulp Paper Mag. Can. 38: 148-149 (1937).—The difficulties encountered in sulphite processing of jack pine are pointed out and briefly discussed.—A.P.-C.

The de la Roza Continuous Digester. Anon. Paper Industry 18: 946-947 (Feb., 1937).—A brief description of the machine.—A.P.-C.

Delaware TAPPI Discusses Greaseproofing

About eighty members attended the meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry held at the Engineers Club, Philadelphia, on Friday, November 12, 1937. James d'A. Clark of the Scott Paper Company presided as chairman. The program consisted of a symposium on greaseproof papers.

C. W. Hoffman of the Riegel Paper Corporation outlined the history of greaseproof papers and described the tests at present used in evaluating greaseproof papers.

C. M. Connor of the Valley Forge Laboratories discussed the blister test, the sand and turpentine test and the recently developed Cobb test.

Miss R. M. Cobb of the Lowe Paper Company exhibited the method of using the test developed by her and showed samples of paper so tested.

W. H. Hirschell of the Bureau of Standards exhibited an apparatus developed by himself in which the loss of oil or grease was measured instead of the gain in moisture.

Following these presentations there was an enthusiastic discussion of the subject.

Among those present were the following: Charles McDowell, McDowell Paper Mills, Manayunk, Pa.; W. E. Brow, Container Corporation of America, Manayunk; M. C. Maxwell, McDowell Paper Mills, Manayunk; H. F. Hoffmann, General Dyestuff Corporation, Philadelphia, Pa.; T. W. Toovey, Pennsylvania Salt Manufacturing Company, Philadelphia, Pa.; G. Van Calster, Mazer Paper Mills, Lansdowne, Pa.; R. T. Mashburn, Hercules Powder Company, Wilmington, Del.; V. Jacobsen, National Aniline and Chemical Company, Philadelphia; C. W. Rivise, Caesar & Rivise, Philadelphia; G. H. Detwiler, Heller & Merz, Philadelphia; A. E. Waugh, U. S. Rubber Company, Philadelphia; H. J. Farra, Pusey & Jones Corporation, Wilmington, Del.; A. S. Hall, Thwing-Albert Instrument Company, Philadelphia, Pa.; G. F. Hom, Messinger Bearings, Inc., Philadelphia; L. F. Derr, Goulds Pumps Inc., Philadelphia; E. J. Albert, Thwing-Albert Instrument Company, Philadelphia; John Roslund, Moore & White Company, Philadelphia; R. T. Bingham, Titanium Pigment Corporation, New York, N. Y.; J. C. Shaw, Container Corporation of America, Manayunk; M. L. Little, Hercules Powder Company, Wilmington, Del.; R. H. Underdown, New York Color and Chemical Company, Philadelphia; B. R. Havens, Container Corporation of America, Manayunk; H. C. Speel, Atlas Powder Company, Wilmington, Del.; H. A. Shnable, Mazar Paper Mills, Lansdowne, Pa.; J. M. Chesnutt, McDowell Paper Mills, Philadelphia; S. D. Reynolds, Container Corporation of America, Manayunk; R. W. Shaffer, MacAndrews & Forbes Company, Camden, N. J.; E. J. Wendt, Hercules Powder Company, Wilmington; J. H. Hazelwood, Philadelphia; F. W. Varden, Barber Company, Philadelphia; J. H. Fritz, National Oil Products Company, Harrison, N. J.; J. C. Dieffenderfer, Hercules Powder Company, Easton, Pa.; E. E. Helm, Reliance Electric and Manufacturing Company, Cleveland, Ohio; E. H. Koontz, same company; D. M. Charles, same company; C. M. Dann, Krebs Pigment and Color Corporation, Newport, Del.; R. W. Ball, same company; W. C. Jay, Sanitary Products Corporation, Philadelphia; A. R. Boyd, F. C. Huyck & Sons, Albany, N. Y.; J. d'A. Clark, Scott Paper Company, Chester, Pa.; D. B. Hopkins, Lowe Paper Company, Ridgefield, N. J.; Ralph Mair, Krebs Pigment and Color Corporation, Newport, Del.; W. P. Ginn, Container Corp. of America, Manayunk; A. McInnes Jr., Pusey & Jones Corporation, Wilmington, Del.; J. R. Atwater, Dill & Collins Inc., Philadelphia: F. W. Brainerd, Scott Paper Company, Chester, Pa.; Henry Childers, Thomas M. Royal & Co., Philadelphia; W. D. Harrison, Riegel Paper Corporation, Milford, N. J.; A. L. M. Bixler, Riegel Paper Corporation, Riegelsville, N. J.; C. M. Connor, Valley Forge Labs., Conshohocken, Pa.; W. J. Higbie, Hercules Powder Co., Wilmington, Del.; W. H. Hirschel, Bureau of Standards, Washington, D. C.; C. W. Hoffman, Riegel Paper Corporation, Milford, N. J.; Miss R. M. Cobb, Lowe Paper Company, Ridgefield, N. J.; F. J. McAndrews, McDowell Papers Mills, Manayunk; P. F. Wehmer, Electrical Testing Laboratories, New York, N. Y.; R. W. K. Ulm, Container Corporation of America, Manayunk; H. M. Spurlin, Hercules Powder Company, Wilmington, Del.; G. L. Schwartz, Du Pont Company, Wilmington, Del.

Grinding of Loblolly Pine. Relation of Wood Properties and Grinding Conditions to Pulp and Paper Quality*

By E. R. Schafer[1], J. C. Pew[2], and C. E. Curran[3]

Abstract

In the production of mechanical pulp for newsprint from loblolly pine, wood having a relatively wide range of properties can be used, but the range of grinding conditions is closely limited. For newsprint purposes the wood should have a growth rate of less than 10 rings per inch and an age of less than 35 years. Green wood yielded better pulp than seasoned wood. Knotty wood required more power than clear wood to produce an equivalent product. Blue-stained wood can be used to a limited extent without much detriment to color. Compression wood lowered the strength and color of the pulp in proportion to the amount present. Heartwood in the young, fast-growth pine had no deleterious effect on color or in causing pitch trouble. In the older, slower growing pine, the presence of heartwood caused an increase in strength as compared with the same type of wood without heartwood, but pitch troubles were in evidence and color was poorer whether heartwood was present or not.

As with other species, the pressure of grinding pine must be adjusted to the sharpness of the stone surface. A dull stone surface, that is, one with well worn grits and rounded edges on the grooves, seems the most suitable for the grinding of pine. High temperatures were found to have an advantage in increasing the fiber length and strength of the pulp, increasing production, and in lowering power consumption per ton of product, provided the high temperature was attained, not by decreasing the quantity of shower water, but by increasing its temperature so that a normal consistency of 4 to 5 per cent was maintained.

The experiments confirm the feasability of making satisfactory ground wood from southern pine if the wood is properly selected and grinding conditions carefully controlled. The experiments have reached a stage where further development would be best made by pilot plant operation.

Introduction

The southern pines have been used in the making of groundwood pulp for container board but have never been used for the commercial production of a newsprint grade of groundwood, although much experimenting has been done. The reason for this up to now has been largely due to the lack of a need for the developing of a new raw material for this grade of pulp and also to conflicting reports as to the suitability of the southern pines for the intended purpose. The increasing dependence of the United States upon foreign countries to supply its needs for products containing groundwood pulp coupled with the growing interest in the desirability of diversifying the products of the pulp industry in the southern states, has prompted a study by the Forest Products Laboratory of the grinding of loblolly pine for a grade of pulp suitable for use in the manufacture of newsprint paper. This work has been done concurrently with similar studies by the acid and alkaline processes.

Previous Work

There is a limited literature on the grinding of pine in both Europe and America but very little of a technical nature has been published on the southern pines. The most recently reported experiments are the work of McNaughton and Allen (*1*), Anderson (*2*), Wynne-Roberts (*3*), and Walker (*4*). The Forest Products Laboratory has studied the grinding of various species of both northern (*5*) and southern pine (*6*) as well as Insignis pine from New Zealand (*7*). The importance of growth conditions on the pulping quality of southern pine has been emphasized by Curran (*8*).

Scope of the Problem

The objective of the present work was to determine the influence of the various characteristics of loblolly pine on the properties of the grounded pulp, and, further, to determine the most suitable grinding conditions for producing a newsprint grade of pulp. In general, the characteristics of loblolly pine are similar to those of all southern pines. The variables studied were:

a) The effect of wood properties,
   - (1) The percentage volume of heartwood,
   - (2) The percentage volume of springwood,
   - (3) The rate of growth,
   - (4) Knots,
   - (5) Seasoning,
   - (6) Blue stain,
   - (7) Compression wood.

b) The effect of grinding conditions,
   - (1) Pressure of wood against the stone,
   - (2) Temperature of grinding,
   - (3) Consistence of pulp.
   - (4) Stone surface.

The Wood Used and Its Preparation

The loblolly pine used in these experiments was selected by a laboratory representative from sites

* Presented (by title) at the Fall meeting of the Technical Association of the Pulp and Paper Industry, DeSoto Hotel, Savannah, Ga., October 18-21, 1937.

Acknowledgement is made to G. C. McNaughton, Technologist, who coordinated this work with similar studies by the chemical pulping processes and to R. G. Knechtges, Assistant Scientific Aid, who assisted in the experimental work.

[1] Member TAPPI, Engineer, Forest Products Laboratory, Forest Service, U. S. Dept. of Agriculture, Madison, Wis.
[2] Member TAPPI, Associate Engineer, Forest Products Laboratory.
[3] Member TAPPI, Principal Chemist, Forest Products Laboratory.

near Sumpter, S. C., and Bogalusa, La., and from Washington Parish, La., and Walthall County, Mississippi. The wood was shipped immediately after cutting and the experimental work started shortly after its receipt at Madison, Wisconsin.

Logs between 5 and 6 inches in diameter were selected for the study of the wood variables, such as heartwood content, rate of growth, and the like. The logs were barked by hand and sawed into bolts 9 inches in length. As many bolts were taken from each log as there were grinder runs to be made in a given series. Ordinarily the wood for one grinder run consisted of 10 bolts, one bolt being taken from each log in the lot. In some of the experiments the bolts were squared so that the pressure of the wood on the stone would be uniform. Care was taken to avoid including large knots or irregularities and also to discard a considerable portion of the dryer ends of the log. Thus each run in a series was made with practically identical wood. Each bolt of wood was weighed and the bolts comprising a grinder run were stored in a closed container at a temperature of 38 deg. F., thereby maintaining the known moisture content until needed.

Equipment and Experimental Procedure

A small two-pocket grinder carrying a pulp stone 26 inches in diameter by 11-inch face and equipped with various temperature and power measuring instruments was used in these experiments (*9*). An artificial stone composed of aloxite abrasive, grit 406, grade K, bond 30 was used in the grinder. This is a relatively course grit stone with a bond of medium harshness. The general procedure in making a grinder run, collecting the pulp, sampling, and testing was essentially as previously reported (*9*).

Since it was desired in a large part of the work to maintain a constant stone surface from series to series, grinder runs were made periodically throughout the course of the experiments under a given set of conditions and with duplicate wood in order to determine whether an appreciable change in stone surface was occurring. The results indicate that only slight differences can be attributed to stone wear. The effect of varying the stone surface was studied in a separate series and will be discussed later.

Results and Discussion of Experiments

The general properties of groundwood pulp from

TABLE I.—EFFECT OF WOOD PROPERTIES ON THE GRINDING OF LOBLOLLY PINE

			Average properties of the wood [1]						Grinding conditions						
			Volume of								Temperature			Yield per 100 pounds dry wood	
Grinder run number	Batch number [2]	Classification	Heartwood, Per cent	Springwood, Per cent	Rate of growth reciprocal, Rings per inch	Dryness, Per cent	Density dry weight/green volume, Pounds per cubic foot	Age, Years	Service of stone since last burring, [3] Hours	Pressure of wood on stone, [4] Pounds per sq. in.	Of shower water, deg. F.	Of grinding, deg. F.	Consistency, Per cent	Screened pulp, [5] Pounds	Screenings, Pounds	Dry wood ground per 24 hours, Tons
		Series 1.—Effect of heartwood														
123	2	Heartwood free	0	58.7	9.2	51.0	30.1	29.0	120.5	27	80	150	5.3	87.1	0.4	1.05
126	2	Containing heartwood	2.3	...	...	...	...	...	122.0	27	80	150	5.4	91.6	.6	1.02
125	2	Containing heartwood	4.5	...	...	...	...	...	121.5	27	80	150	5.7	89.4	.6	1.05
124	2	Containing heartwood	9.1	...	...	...	...	...	121.0	27	80	150	5.1	88.4	.5	.96
149	3	Containing heartwood	52.1	(10)	(10)	78.0	26.3	(10)	138.6	26	80	150	4.6	84.4	.6	.59
		Series 2.—Effect of Springwood														
127	4	Low springwood	.1	54.8	5.5	47.7	29.4	15.7	122.5	28	80	150	5.2	89.4	.4	.98
129	4	Low springwood	...	...	...	...	...	...	123.5	21	80	150	4.5	88.5	.4	.65
131	4	Low springwood	...	...	...	...	...	...	124.7	14	80	150	3.5	91.0	.2	.33
147	6	Low springwood	.3	56.4	4.9	48.4	30.8	16.0	137.4	21	80	150	4.5	90.0	.2	.62
128	5	Medium springwood	.7	67.9	5.0	42.5	25.3	13.5	123.0	28	80	150	5.3	93.0	.4	.89
130	5	Medium springwood	...	...	...	...	...	...	124.1	21	80	150	4.2	89.0	.5	.58
132	5	Medium springwood	...	...	...	...	...	...	126.0	13	80	150	3.2	90.4	.4	.30
148	7	High springwood	0	78.5	3.7	37.0	23.6	13.0	138.1	21	80	150	4.5	90.0	.2	.70
175	8	High springwood	0	83.5	2.1	36.3	23.4	6.3	157.3	21	80	150	3.6	87.8	.3	.60
		Series 3.—Effect of rate of growth														
133	9	Slow rate	1.5	60.4	10.0	49.0	29.6	27.0	127.2	28	80	150	5.2	91.5	.6	.86
135	9	Slow rate	...	...	...	...	...	...	128.2	21	80	150	4.4	93.2	.3	.60
137	9	Slow rate	...	...	...	...	...	...	129.5	13	80	150	3.4	93.0	.3	.30
134	10	Medium rate	.6	61.5	4.8	44.9	27.8	13.0	127.6	28	80	150	4.7	90.6	.3	.79
136	10	Medium rate	...	...	...	...	...	...	128.8	21	80	150	4.3	89.9	.3	.56
138	10	Medium rate	...	...	...	...	...	...	130.9	13	80	150	3.3	95.2	.4	.32
175	8	Fast rate	0	83.5	2.1	36.3	23.4	6.3	157.3	21	80	150	3.6	87.8	.3	.60
		Series 4.—Effect of knots														
140	11	Knotty wood [11]	.1	65.1	6.5	44.0	27.2	18.7	132.7	20	80	150	3.1	92.0	.3	.42
142	11	Knotty wood [11]	...	...	...	...	...	...	134.7	28	80	150	3.4	97.8	.4	.60
141	11	Clear wood	...	...	...	...	...	...	133.9	20	80	150	3.7	89.2	.4	.56
143	11	Clear wood	...	...	...	...	...	...	135.5	28	80	150	4.9	89.4	.3	.90
		Series 5.—Effect of seasoning														
164	12	Green	.1	60.6	5.4	44.0	27.9	14.8	149.0	21	80	150	4.3	88.2	.3	.58
165	12	Seasoned	...	...	...	65.0	...	...	149.6	21	80	150	3.9	88.7	.3	.56
166	12	Seasoned	...	...	...	85.0	...	...	150.5	21	80	150	3.6	87.5	.5	.49
167	12	Seasoned and resoaked	...	...	...	46.2	...	...	151.4	21	80	150	4.2	90.2	.5	.52
		Series 6.—Effect of blue stain [12]														
173	13	Blue stained	(12)	(12)	(12)	40.8	(12)	(12)	156.0	25	80	150	3.9	91.8	1.0	.52
174	13	Not blue stained	...	...	...	40.8	...	...	156.7	25	80	150	3.7	97.8	1.2	.50

[1] All experiments were made with wood from shipment 1425 except grinder run 175 which was made with wood from shipment 1441.
[2] Except as otherwise indicated, identical wood was used in grinder runs associated with the same batch number. Hence, to avoid repetition the properties of each batch of wood are recorded only once in each series; i.e., opposite the grinder run in which it was first used.
[3] The Aloxite grindstone had been dressed with a 10 cut, 1¼ lead spiral burr and in service 120 hours prior to the start of the experiment. After this time change in the condition of the stone surface due to wear was expected to be slow. See Table IV, footnote 11.
[4] The cylinder pressure was corrected for the (calibrated) friction loss in the pistons and piston rod glands and reduced to the average unit pressure of wood against stone on the basis of the average lengths and diameter of the bolts of wood.
[5] Low yields obtained in many experiments were due to excessive white water losses on the wet machine.

GENERAL PROPERTIES OF GROUNDWOOD PULP FROM VARIOUS TYPES OF LOBLOLLY PINE COMPARED TO THE AVERAGE OF COMMERCIAL NEWSPRINT GROUNDWOOD PULP

Rate of Growth	Spring-wood Content	Without Heartwood				With Heartwood			
		Power Consumed	Strength	Color	Pitch	Consumed Power	Strength	Color	Pitch
Fast	High	Slightly above average	Good	Good	No evidence	No tests	No tests—Probably same as for Medium Springwood		
	Medium	Average	Good	Good	No evidence	Average	Good	Good	No evidence
	Low	Average	Good	Good	No evidence	No tests	No tests—Probably same as for Medium Springwood		
Slow	Medium	Slightly below average	Fair	Fair	Some evidence	Average	Good	Poor	Very evident
	Low	Slightly below average	Fair	Fair	Some evidence	No tests	No tests—Probably same as for Medium Springwood		

various types of loblolly pine compared with the average of commercial newsprint groundwood pulp are shown in the accompanying chart. The details of the experiments are discussed in the following paragraphs.

Series 1 Effect of Heartwood

The young, fast-growth wood selected for this series, averaging 9.1 per cent of heartwood by volume, was divided into four lots, one lot for each grinder. Of one lot one-half the heartwood was

TABLE I.—EFFECT OF WOOD PROPERTIES ON THE GRINDING OF LOBLOLLY PINE—(Continued)

Grinder run number	Properties of pulp suspension: Power: Input, Hp.	Power: Perton[6] dry wood, Hp. days	Freeness Schopper Riegler, Cc.	Screen analysis: Retained on 24-mesh, Per cent	Retained between: 24 and 42-mesh, Per cent	Retained between: 42 and 80-mesh, Per cent	Retained between: 80 and 150-mesh, Per cent	Passing 150-mesh, Per cent	Average screen opening of pulp, Mm.	Properties of pulp test sheets[7]: Bursting, Per pound per ream, 25x40—500, Points	Tearing, Per pound per ream, 25x40—500, Grams	Tensile per square inch, Pounds	Solid fraction	Color analysis: Ives readings: Red, Parts	Ives readings: Green, Parts	Ives readings: Blue,[8] Parts	Hue[9]: Primary, Per cent and tint	Hue[9]: Secondary, Per cent and tint	Total luminosity, Per cent
Series 1.—Effect of heartwood																			
123	44.5	42.3	335	2.8	5.8	15.7	20.7	55.0	0.078	0.10	0.38	687	0.26	81	74	66	4.5-O	4.1-Y	74.6
126	48.3	47.2	330	2.8	6.6	15.9	19.3	55.4	.078	.10	.44	637	.27	80	74	66	4.5-Y	3.8-O	74.3
125	48.8	45.4	330	2.5	4.6	15.3	17.6	59.0	.075	.09	.42	605	.27	81	73	65	5.1-O	3.6-Y	73.7
124	45.1	46.6	330	3.4	5.2	16.2	20.6	54.6	.078	.10	.37	755	.27	80	74	66	4.5-Y	3.8-O	74.3
149	36.6	61.2	300	2.9	8.8	15.6	17.0	55.7	.079	.12	.54	742	.25	82	73	64	5.8-O	4.1-Y	73.9
Series 2.—Effect of Springwood																			
127	45.1	45.0	360	2.9	6.7	18.7	19.3	52.4	.081	.11	.38	657	.25	84	73	67	7.0-O	.5-Y	74.5
129	33.8	51.0	303	2.5	7.8	14.8	17.8	57.1	.077	.12	.39	950	.27	82	73	64	5.8-O	4.1-Y	73.9
131	26.9	72.5	238	1.8	6.1	15.3	20.7	56.1	.077	.17	.45	1163	.28	79	69	62	6.4-O	1.8-Y	70.2
147	37.3	63.2	303	3.1	8.2	16.3	16.7	54.7	.079	.14	.40	830	.27	84	75	65	5.8-O	5.0-Y	75.8
128	39.1	43.7	325	1.7	8.1	17.3	20.2	52.7	.080	.12	.38	746	.26	85	77	71	5.1-O	1.8-Y	77.9
130	37.6	64.2	248	2.5	9.0	14.7	18.7	55.1	.079	.15	.45	1150	.27	79	70	64	5.8-O	1.4-Y	71.2
132	28.4	93.0	197	0.8	5.1	13.9	22.5	57.7	.075	.19	.48	1487	.30	81	73	66	5.1-O	2.7-Y	73.8
148	39.1	55.3	326	2.5	8.9	20.9	18.9	48.7	.085	.12	.53	788	.26	83	76	69	4.5-O	3.2-Y	76.7
175	41.6	68.3	255	2.8	12.2	15.1	18.5	51.5	.083	.17	.42	987	.28	84	76	70	5.1-O	1.8-Y	76.9
Series 3.—Effect of rate of growth																			
133	38.4	44.5	345	3.4	8.0	16.8	18.2	52.6	.081	.11	.32	648	.25	78	71	61	5.9-Y	4.5-O	71.4
135	34.7	57.2	290	2.7	7.2	15.4	19.3	55.4	.078	.14	.33	885	.27	77	72	65	5.0-Y	3.2-O	73.2
137	27.1	90.5	188	0.6	5.3	14.3	17.1	62.7	.072	.17	.32	1217	.29	79	71	63	5.1-O	3.6-Y	71.7
134	44.8	56.3	302	2.7	9.0	17.7	20.4	50.2	.083	.14	.30	822	.26	80	71	63	3.2-O	1.3-Y	67.5
136	34.5	60.8	278	1.1	8.3	16.3	16.5	57.8	.076	.16	.34	945	.28	79	71	62	5.1-O	4.5-Y	71.6
138	26.5	82.3	213	2.3	6.3	16.6	7.3	67.5	.070	.20	.31	1302	.30	78	71	65	4.5-O	2.3-Y	71.8
175	41.6	68.3	255	2.8	12.2	15.1	18.5	51.5	.083	.17	.42	987	.28	84	76	70	5.1-O	1.8-Y	76.9
Series 4.—Effect of knots																			
140	38.0	89.8	172	0.9	4.3	12.9	19.5	62.4	.072	.19	.40	1571	.30	81	72	67	5.8-O	.5-Y	73.3
142	51.4	85.3	185	0.7	4.5	12.8	12.2	69.8	.067	.17	.36	1260	.29	81	72	65	5.8-O	2.3-Y	73.1
141	35.1	62.9	230	1.2	4.5	17.0	12.0	65.3	.071	.18	.36	1220	.29	79	74	66	5.0-Y	3.2-O	74.2
143	48.2	53.2	305	2.0	5.1	19.8	14.4	58.7	.076	.14	.38	989	.27	80	70	66	5.1-O	.4-R	71.5
Series 5.—Effect of seasoning																			
164	37.4	63.9	323	3.2	7.3	17.2	21.6	50.7	.082	.13	.52	920	.27	81	73	66	5.1-O	2.7-Y	73.8
165	37.2	66.2	275	2.4	5.2	16.2	20.5	55.8	.077	.15	.55	1141	.28	79	70	62	5.8-O	3.2-Y	71.0
166	34.5	70.7	212	1.4	5.2	12.4	18.5	62.6	.072	.15	.43	1138	.29	78	69	62	5.8-O	2.3-Y	70.1
167	38.5	73.2	255	2.5	7.8	14.7	18.2	56.8	.078	.16	.54	1036	.28	78	71	61	5.9-Y	4.5-O	71.4
Series 6.—Effect of blue stain[10]																			
173	32.8	62.5	300	8.0	14.0	14.6	17.1	46.4	.090	.22	.60	1173	.28	69	61	56	5.1-O	0.9-Y	62.0
174	36.3	72.5	255	7.8	13.1	15.0	16.6	47.5	.089	.21	.69	987	.28	80	73	67	4.5-O	2.3-Y	73.8

[6] Power consumption is based on wood instead of pulp because of conditions stated in footnote 5.
[7] Strength tests were made with sheets of approximately 115 pounds per ream at 65 per cent relative humidity and 72 deg. F.
[8] The degree of whiteness is indicated by the lowest Ives reading, which was the blue for all pulps recorded here.
[9] The tint is designated as follows: Y, yellow; O, orange; R, red.
[10] Not determined. The wood consisted of rectangular blocks cut from the center of the logs.
[11] The surface area of knots in the knotty wood of this batch was about 2.8 per cent of the total area of the bolts exclusive of the ends.
[12] Not determined. The wood was cut into boards 9 by 2.5 by 1 inches, some of which were completely blue stained by inoculation with Ceratostomella pilifera.
[13] See also Table III.

bored out, theree-quarters from another, all from a third, and none from the fourth. The conditions of grinding are shown in Table I. It was found that the color of the resulting pulps was practically unimpaired by the presence of heartwood in the quantities existing in these samples.

A grinder run was then made with squared wood containing larger quantities of heartwood cut from the center of logs that had been stored in the yard 3 months with the bark removed. In this sample the volume of heartwood was 52.1 per cent. The resulting pulp was slightly poorer in color than that of the previous runs.

From these tests it may be concluded that, for mechanical pulping, young heartwood in loblolly pine (the diameter of the heartwood in the wood used being less than 2 inches in most cases) is not detrimental so far as color is concerned even though the heartwood is somewhat reddish in color.

The effect of heartwood in older wood with a higher springwood content but of about the same growth rate was determined under somewhat different grinding conditions. The data are given in Table II. The wood used in grinder run 206 was practically the same in physical properties as that used in grinder run 204 (i.e. of slow rate of growth and medium springwood content) except that the former contained 40 per cent heartwood. The presence of the heartwood in this older wood caused a marked increase in the strength of the pulp, in relation to the power consumed, as compared with the heart-free material. However, a loss of 2 parts whiteness and 2.6 per cent total luminosity in the photometric analysis was caused by the heartwood and pitch was very evident whether heartwood was present or not.

The age of the wood may be considered as of minor importance yet cannot be wholly neglected since it is linked up with heartwood formation. Out of 539 logs having a growth rate of less than 11 rings per inch 33, or 6 per cent, were over 35 years of age. The average heartwood content of the 33 logs was 5.1 per cent by volume, the maximum being 21.5 per cent (in a log 56 years of age) and the minimum 0.1 per cent (in a log 36 years of age). The average heartwood content of the 506 logs less than 35 years of age was 1.3 per cent by volume, the maximum being 12 per cent. Even though the average for all the logs including those greater than 35 years old was only 1.6 per cent of heartwood, the younger heartwood seems less deleterious than the older and therefore it would appear that for best results the wood should be less than 35 years of age.

Series 2 Effect of Springwood

Two lots of wood of practically equal rates of growth (batches 4 and 5, Table I), containing respectively low and medium volumes of springwood were each ground at three different pressures. In another lot of wood (batch 6) in which the bolts had all been turned in a lathe to about the same diameter, the rate of growth and volume of springwood of the remaining wood were about equivalent to that of batch 4. The wood in batch 6 was ground at approximately the intermediate of the pressures used in batches 4 and 5. A companion lot of wood (batch 7), also turned in a lathe to the same diameter but with a high volume of springwood in the remaining wood, was ground at the same intermediate pressure. Finally there is included in this series a run on wood (batch 8) of extremely high rate of growth and volume of springwood, which was also ground at the intermediate pressure. It may be noted from the data that in general higher volumes of springwood yield slightly stronger pulps but at the expense of a slightly increased power consumption. There is also in general a slight improvement in the color of the pulp as the volume of springwood is increased.

This was confirmed later in grinder runs 201, 202, and 203 made with fast-growth wood (Table II). The grinding rate was lower with the high springwood material (grinder run 202) than with either the medium springwood (grinder run 201) or the low springwood (grinder run 203). Since the power input was about the same in all three cases, a higher power consumption per unit of wood ground resulted with the high springwood. There was little variation in the strength of the pulps produced, but

TABLE II.—SUPPLEMENTARY TESTS ON THE EFFECT OF WOOD PROPERTIES ON THE GRINDING OF LOBLOLLY PINE

Grinder run number	Classification	Average properties of the wood [1]						Grinding conditions							
		Rate of growth reciprocal, Rings/inch	Volume of— Springwood, Per cent	Volume of— Heartwood, Per cent	Dryness, Per cent	Density dry weight per green volume, Lbs./cu. ft.	Age, Years	Service of stone since last burring,[2] Hours	Pressure of wood on stone[3] Lbs./sq. inch.	Temperature Of grinding, deg. F.	Temperature Of shower water, deg. F.	Consistency, Per cent	Yield per 100 pounds dry wood Screened pulp, Pounds	Yield per 100 pounds dry wood Screenings, Pounds	Dry wood ground per 24 hours, Tons	Power Input, Hp.	Power Per ton dry wood, Hp. days
201	Rapid growth—medium springwood	3.3	66	0	40.7	26.6	17.0	175.0	25.0	190	126	4.0	77.2	0.26	0.57	39.7	70.2
202	Rapid growth—high springwood	2.2	80	0	39.2	23.9	6.9	175.8	25.0	190	110	4.5	87.4	.55	.51	41.6	80.9
203	Rapid growth—low springwood	2.7	50	0	49.0	30.4	20.0	177.8	25.0	190	110	4.9	90.8	.40	.56	40.6	71.5
204	Slow growth—medium springwood	9.7	64	0	48.8	29.7	41.7	180.3	25.0	190	113	5.5	91.6	.68	.61	40.1	65.3
205	Slow growth—low springwood	10.3	49	0	52.2	33.2	54.0	185.3	25.0	190	110	5.6	93.3	.50	.56	36.9	65.3
206	Slow growth—medium springwood containing heart	11.0	65	40.0	53.7	28.3	57.7	187.5	25.0	190	111	4.8	91.6	.20	.57	40.6	71.7
211	Rapid growth—medium springwood—11 per per cent compression wood	2.4	63	.9	43.4	26.8	12.8	238.8	25.0	190	114	4.0	96.0	.52	.57	49.8	87.5
[7] 211-A	Rapid growth—25 per cent compression wood	...	..	...	...	...	...	....	25.0	190	114	..	...	...	.53	50.3	91.4
[7] 211-B	Rapid growth—no compression wood	...	..	...	...	...	...	....	25.0	190	114	..	...	...	.51	47.6	93.5
[7] 211-C	Rapid growth—all compression wood	...	..	...	...	...	...	....	25.0	190	114	..	...	...	.91	55.2	60.4

[1] The wood was selected from shipment 1459.
[2] An Aloxite stone grade 406-K-30, dressed with a 9 cut, 4½ inch lead spiral burr followed by a 4 cut straight burr.
[3] In runs 201 to 206, inclusive, the wood was cut into rectangular blocks 6 inches wide and 9 inches long. The pressure of the wood against the stone was calculated from the actual thrust delivered by the pressure foot, as determined by calibration, and the area of the block facing the stone. In run 211 the bolts were 10 to 12 inches in diameter and therefore had to be cut down on two sides to fit into the 8-inch wide grinder pocket.

the pulp from the pine of high springwood content showed a much lower retention on the 24-mesh screen in the screen analysis test than the other two pulps.

Grinder runs 204 and 205 were made with slow-growth material containing medium and low contents of springwood, respectively. The low springwood material ground more slowly than the medium springwood but the power input was also lower so that the power consumption was the same in both cases. The low springwood produced shorter-fibered pulp of lower bursting strength than did the medium springwood.

It is concluded that while certain advantages may be gained by using wood with high volumes of springwood they are not marked and may readily be overshadowed by other factors.

Series 3 Effect of Rate of Growth

For this series of experiments two lots of wood (batches 9 and 10, Table I) of slow and medium rates of growth, respectively, were so selected that all other properties were nearly identical. These were each ground at three pressures. Included in the series is the grinder run of the wood (batch 8) mentioned above of extremely high rate of growth and volume of springwood which was ground at the intermediate pressure.

The effects noted in Table I are that at the intermediate and high pressures of grinding, the wood of faster growth rate gives pulps with slightly better strength at the expense of increased power per ton of product but that, on the other hand, at the low pressure, the wood of medium rate of growth gave pulp of better strength with somewhat lesser power consumption. The pulp from wood with high rate of growth and high volume of springwood (grinder run 175) ground at the intermediate pressure was not markedly different in properties from the slow and medium rate of growth woods (medium volume of springwood) ground at that pressure.

Comparing grinder runs shown in Table II made with wood of the same springwood content but different growth rates (run 201 with 204; run 203 with run 205), it is evivdent that the slower growth wood, in spite of lower power consumption, is less desirable than fast growth. Slower growth wood gives pulps with shorter fiber and lower strength per unit of power consumed. The pulps from the slower-growth wood were inferior in color, being on the average about three points lower in whiteness. Moreover, greater difficulty was experienced on the wet machine with slow-growth wood because of pitch.

The results indicate on the whole that for a quality of pulp suitable for newsprint the rate of growth should not be less than that used in these experiments, that is, about 10 rings per inch, and that the faster the rate of growth the more satisfactory the results are apt to be.

Series 4 Effect of Knots

Wood containing knots and wood free of knots cut from the same logs were each divided into two lots which were subjected to different pressures. Measured on the basis of the total external knot area, both knotty lots contained about the same amount of knotty material.

Knots in the wood lower the grinding rate (see Table I), and raise the power consumption but cause slightly stronger pulps to be produced. This is attributed to the probability that the knots, which grind slower than the clear wood, take most of the load and in effect lower the pressure on the surrounding clear wood. Referring to grinder runs 141 and 142, it may be noted that if the pressure on knotty wood is raised sufficiently above that used with the clear wood to give about equal grinding rates the pulps obtained are practically equal in quality but considerably higher power consumption is required for the knotty wood.

Aside from the consideration of strength and power consumption, it is known, of course, that the presence of much knotty wood introduces an objectionable amount of dirt.

Series 5 Effect of Seasoning

Green loblolly pine containing 45 per cent of dry wood was divided into four lots. The first lot was kept green, in a room maintained at 38 deg. F. and 95 per cent relative humidity. The other three were seasoned in a room controlled at 80 deg. F. and 65

TABLE II.—SUPPLEMENTARY TESTS ON THE EFFECT OF WOOD PROPERTIES ON THE GRINDING OF LOBLOLLY PINE—(Continued)

Grinder run number	Properties of pulp suspension: Screen analysis: Freeness Schopper-Riegler, Cc.	Retained between— Retained on 24 mesh, Per cent	24 and 42 mesh, Per cent	42 and 80 mesh, Per cent	80 and 150 mesh, Per cent	Passing 150 mesh, Per cent	Average screen opening of pulp, Mm.	Properties of pulp test sheet [4]: Bursting, Per lb. per ream 25x40x500, Points	Tearing, Per lb. per ream 25x40x500, Grams	Tensile per sq. in, Pounds	Strength per unit of power (×100): Bursting, Per lb. per ream 25x40x500, Points	Tearing, Per lb. per ream 25x40x500, Grams	Tensile per sq. in, Pounds	Solid fraction	Color analysis: Ives readings: Red, Parts	Green, Parts	Blue,[5] Parts	Hue [6]: Primary, Per cent and tint	Secondary, Per cent and tint	Total luminosity, Per cent
201	272	20.9	11.0	14.1	14.5	39.5	0.103	0.22	0.72	953	0.31	1.00	1310	0.23	80	71	62	5.8-O	4.1-Y	71.9
202	208	11.1	12.5	15.9	15.9	44.7	.093	.22	.80	1180	.27	.99	1460	.25	80	73	65	4.5-O	4.1-Y	73.6
203	218	19.4	10.6	13.8	13.3	42.9	.098	.24	.77	1095	.34	1.08	1530	.24	81	73	65	5.1-O	3.6-Y	73.7
204	298	11.3	9.5	16.1	19.2	43.9	.092	.15	.53	848	.23	.81	1300	.24	81	72	62	5.8-O	5.0-Y	72.8
205	288	6.4	7.7	15.1	20.3	50.5	.083	.12	.52	864	.18	.80	1320	.25	82	71	61	7.0-O	4.1-Y	72.1
206	273	14.1	10.3	15.0	17.2	43.4	.094	.20	.64	1075	.28	.89	1500	.24	80	69	60	7.0-O	3.2-Y	70.2
211	200	15.2	11.4	13.4	14.1	46.1	.093	.24	.73	1143	.27	.83	1308	.24	81	74	66	4.5-O	4.1-Y	74.6
211-A	...	10.4	10.4	13.5	16.3	49.4	.087	.23	.65	1145	.25	.71	1255	.25	81	73	66	5.1-O	2.7-Y	73.8
211-B	...	14.8	10.8	14.0	15.2	45.2	.094	.27	.74	1376	.29	.74	1470	.26	82	74	66	5.1-O	3.6-Y	74.7
[8]211-C	255	7.1	8.7	15.3	22.3	46.6	.088	.09	.39	463	.15	.65	767	.20	80	70	61	6.4-O	3.6-Y	71.0

[4], [5] and [6] See Table I, footnotes 7, 8, and 9, respectively.

[7] Wood used was certain of the bolts segregated from the rest of the wood while making run 211. Data for run 211 includes the wood used in these runs.

[8] Tests made on slush pulp taken at grinder dam. All other tests were made on samples taken at the wet machine.

per cent relative humidity. One of these lots was raised to 65 per cent dryness and the other two to 85 per cent.

The effects of grinding the seasoned wood are shown in Table I. The drier wood as compared with the green material ground slightly slower, consumed more power per ton, and gave a considerably shorter fibered pulp with lower freeness, but without affecting the strength properties greatly.

One of the lots of wood, which was dried to 85 per cent, was afterward soaked in water for several days, but the amount of water taken up was found to be small. A vacuum and pressure treatment was then resorted to in order to drive the water into the wood. After the treatment the wood had a dryness of 46 per cent. It was allowed to stand 24 hours in this condition before grinding. It is noted in grinder run 167 that the power consumption of this wood was more than with the original green wood and the strength somewhat better.

The color analysis shows that green wood gives a pulp of better color than is obtained from seasoned wood.

Series 6 Effect of Blue Stain

The wood for the blue stain experiments was cut into 1-inch by 2-½ inch boards, and then divided into two lots. Both were sterilized with steam at atmospheric pressure for one-half hour. One lot was then inoculated with *Ceratostomella pilifera* which is one of the most common blue-stain organisms found in southern pine, stored in a closed container at normal room temperature and humidity, and allowed to become completely stained. The other lot was kept free from stain in a cold room.

Table I shows that there is no appreciable difference in the strength of the pulp from stained and unstained wood. Test sheets made of various mixtures of the two pulps were subjected to photometric analyses. The results shown in Table III indicate that use of up to 10 per cent of blue-stained wood causes a masking of the natural orange tint without loss of whiteness. Blue-stained wood used in amount of 20 per cent or more causes a distinct loss in whiteness.

TABLE III.—COLOR ANALYSIS OF MIXTURES OF PULPS FROM SERIES 6 CONTAINING VARIOUS AMOUNTS OF BLUE STAIN

Pulp mixtures		Ives readings			Hue [1]		Total luminosity
Blue-stained	Not blue-stained	Red	Green	Blue [2]	Primary	Secondary	
Per cent		Parts			Per cent and tint		Per cent
0	100	80	73	67	4.5-O	2.3-Y	73.8
5	95	75	73	67	4.5-Y	1.3-O	72.8
10	90	75	71	67	2.6-O	1.8-Y	71.4
20	80	73	69	65	2.6-O	1.8-Y	69.4
30	70	72	67	63	3.2-O	1.4-Y	67.6
50	50	70	65	60	3.2-O	2.3-Y	65.5
100	0	69	61	56	5.1-O	0.9-Y	62.0

[1] See Table I, footnote 9.
[2] See Table I, footnote 8.

Series 7 Effect of Compression Wood

A study of the occurrence of compression wood in black spruce and its effect on the quality of groundwood pulp showed it yielded pulp of lower strength and shorter fiber than that obtained from normal wood (*10*). It has been found that compression wood in pine has similar effects. Certain of the bolts in grinder run 211, Table II, contained large amounts

TABLE IV.—EFFECT OF PULPING VARIABLES IN THE GRINDING OF LOBLOLLY PINE

Grinder run number	Batch number [2]	Classification	Average properties of the wood [3]: Volume of Heartwood, Per cent	Volume of Springwood, Per cent	Rate of growth reciprocal, Rings per inch	Dryness, Per cent	Density dry weight/green volume, Pounds per cubic foot	Age, Years	Grinding conditions: Service of stone since last burring,[4] Hours	Pressure of wood on stone,[5] Pounds per sq. in.	Temperature: Of shower water, deg. F.	Temperature: Of grinding, deg. F.	Consistency, Per cent	Yield per 100 pounds dry wood: Screened pulp,[6] Pounds	Yield per 100 pounds dry wood: Screenings, Pounds	Dry wood ground per 24 hours, Tons
Series 8.—Effect of pressure																
131	4	Low springwood.....	0.1	54.8	5.5	47.7	29.4	15.7	124.8	14	80	150	3.5	91.0	0.2	0.33
144	14	Low springwood.....	.4	58.5	5.3	46.2	28.9	15.1	136.0	21	80	150	4.3	92.2	.5	.63
127	4	Low springwood.....	...	...	...	...	...	...	122.5	28	80	150	5.2	89.4	.4	.98
145	14	Low springwood.....	...	...	...	...	...	...	136.8	36	80	150	5.0	89.0	.3	1.26
146	14	Low springwood.....	...	...	...	...	...	...	137.2	50	80	150	5.9	88.5	.5	1.92
Series 9.—Effect of stone surface [10]																
132	5	Medium springwood.....	.7	67.1	5)	42.5	25.3	13.5	126.0	13	80	150	3.2	90.4	.4	.30
177	20	Medium springwood.....	.3	63.8	4.7	42.7	26.7	13.1	60.5	14	80	150	4.2	93.1	.3	.34
122	1	Medium springwood.....	.6	61.0	5.1	45.0	27.6	14.3	120.0	28	80	150	5.1	...	.7	.92
176	1	Medium springwood.....	...	...	...	...	...	...	60.0	28	80	150	5.4	92.6	.4	.85
146	14	Low springwood.....	.4	58.5	5.3	46.2	28.9	15.1	136.8	50	80	150	5.9	88.5	.5	1.92
178	20	Medium springwood.....	...	...	...	...	...	...	61.6	42	80	150	5.8	86.1	.3	1.35
168	19	High springwood.....	0	72.0	4.1	41.8	25.4	10.5	150.5	13	80	190	5.6	89.5	.3	.26
179	20	Medium springwood.....	...	...	...	...	...	...	61.9	14	101	190	6.1	88.2	.2	.28
180	20	Medium springwood.....	...	...	...	...	...	...	63.1	14	150	200	6.2	93.6	.2	.36
201	..	Medium springwood.....	0	66.0	3.3	40.7	26.6	17.0	175.0	25	126	190	4.0	77.2	.3	.57
Stone surface in Series 1 to 6 inclusive, 8 and 10 [11]																
122	1	Medium springwood.....	.6	61.0	5.1	45.0	27.6	14.3	120.0	28	80	150	5.1	...	.7	.92
139	1	Medium springwood.....	...	...	...	...	...	...	132.2	28	80	150	4.9	92.0	.4	.86
150	1	Medium springwood.....	...	...	...	...	...	...	139.4	28	80	150	5.0	92.9	.4	.91
163	1	Medium springwood.....	...	...	...	...	...	...	148.5	28	80	150	4.7	90.9	.4	.85
Miscellaneous tests for comparison																
169	21	Black spruce.....	78.3	74.8	13.7	62.4	26.4	44.0	153.8	21	80	150	2.9	88.3	.3	.39
170	21	Black spruce.....	...	...	...	...	...	...	155.0	35	80	160	...	...	...	.97
P1037	..	Commercial spruce groundwood	...	...	...	...	...	...	....	..	..	...	...	...	...	...
P1101	..	Commercial spruce groundwood	...	...	...	...	...	...	....	..	..	...	...	...	...	...

[1] All experiments were made with wood from shipment 1425 except grinder runs 169 and 170 which were made from shipment 1440, and run 201 made from shipment 1459.
[2] See Table I, footnote 2.
[3] Except as otherwise noted in Series 9, the pattern of the stone surface was as described in Table I, footnote 3.
[4], [5], [6], [7], [8], [9] See Table I, footnotes 4, 5, 6, 7, 8, and 9, respectively.

of compression wood and were segregated from the main lot and ground separately. The data are tabulated as runs 211-A and 211-C. Run 211-B was wood free from compression wood. It is noted that moderate amounts of compression wood, as indicated in runs 211 and 211-A, cause a slight reduction in fiber length and somewhat lowered strength properties in the resulting pulp. Wood consisting all of compression wood (run 211-C) gave a very weak, bulky pulp of poor color.

Series 8 Effect of Pressure

Wood of medium rate of growth and low volume of springwood was ground under various pressures at constant condition of temperature. The effects of pressure noted in Table IV agree pretty well with that experienced on other species. For the given stone surface, the power consumption and the strength of the pulp drop considerably with rising pressure. This is accompanied by a substantial increase in the production rate and freeness and by a slight increase in the fiber length as indicated by the average screen opening. For pine, as in the grinding of other woods, the pressure must be adjusted according to the stone surface in order to obtain the desired results.

Series 9 Effect of Stone Surface

It has been reported (*11*) that a good stone surface for use on southern pine is obtained with a combination of a 9-cut, 4½ inch lead spiral burr and a 4-cut straight burr. After completion of grinder run 175, burrs of these types were applied to the stone and followed with a wearing-in period of 60 hours on miscellaneous wood. Several grinder runs were then made under various conditions. Referring to the series in Table IV and comparing grinder runs 132 with 177, and 122 with 176, it may be noted that under the same grinding conditions the newer surface gives pulp of poorer strength, but at lower power consumption than the older surface, indicating a sharper stone. Comparison between grinder runs 168 and 179 shows that lower pressure with the newer stone surface gave about the same power consumption as with higher pressure on the older surface. Although not strictly comparable on account of the difference in the wood, the high temperature, runs 168 and 179 again show the lower strength and lower power on the new surface due to the sharpness of the latter. However, when subsequently the surface had been well worn in and used with a higher pressure (see grinder run 201) a pulp of much better quality was obtained.

These tests, while not extensive, indicate as pointed out previously, that pressure and stone surface are dependent on each other. It further appears that the pattern is secondary to the condition of the surface and that a surface with well worn grits and rounded edges on the grooves seems the most suitable for the grinding of pine.

Series 10 Effects of Temperature and Consistency

A considerable part of this investigation was concerned with the effect of the temperature of grinding and has already been reported (*9*) (*12*). The data are, therefore, not reproduced here. Briefly it was found that the grinding process was favored by high

TABLE IV.—EFFECT OF PULPING VARIABLES IN THE GRINDING OF LOBLOLLY PINE—(Continued)

Grinder run number	Power: Input, Hp.	Power: Per ton [6] dry wood, Hp. days	Properties of pulp suspension: Screen analysis: Freeness Schopper Riegler, Cc.	Retained on 24-mesh, Per cent	Retained between: 24 and 42-mesh, Per cent	42 and 80-mesh, Per cent	80 and 150-mesh, Per cent	Passing 150-mesh, Per cent	Average screen opening of pulp, Mm.	Properties of pulp test sheets [7]: Bursting, Per pound per ream, 25x40—500, Points	Tearing, Per pound per ream, 25x40—500, Grams	Tensile per square inch, Pounds	Solid fraction	Color analysis: Ives readings: Red, Parts	Green, Parts	Blue, [8] Parts	Hue [9]: Primary, Per cent and tint	Secondary, Per cent and tint	Total luminosity, Per cent
Series 8.—Effect of pressure																			
131	26.9	72.5	238	1.8	6.1	15.3	20.7	56.1	0.077	0.17	0.45	1163	0.28	79	69	62	6.4-O	1.8-Y	70.2
144	39.1	62.3	303	2.8	6.7	18.9	14.8	56.8	.078	.15	.38	844	.26	80	72	68	5.1-O	....	73.1
127	45.1	45.0	360	2.9	6.7	18.7	19.3	52.4	.081	.11	.38	657	.25	84	73	67	7.0-O	0.5-Y	74.5
145	51.5	40.6	412	3.3	9.1	18.0	22.1	47.5	.086	.10	.31	702	.25	84	72	66	5.1-O	1.1-R	72.2
146	71.7	37.2	493	3.6	10.5	17.7	21.4	46.8	.087	.08	.27	362	.21	81	72	64	5.8-O	3.2-Y	73.0
Series 9.—Effect of stone surface [10]																			
132	28.4	92.5	197	0.8	5.1	13.9	22.5	57.7	.075	.19	.48	1487	.30	81	73	66	5.1-O	2.7-Y	73.8
177	25.9	71.6	227	1.0	3.3	15.2	22.5	58.0	.075	.14	.32	1039	.28	79	71	64	5.1-O	2.7-Y	71.8
122	44.0	47.2	350	1.7	6.0	15.7	22.9	53.7	.079	.11	.39	725	.26	81	72	68	5.1-O	0.2-R	73.3
176	37.1	40.0	375	1.1	3.9	15.7	21.3	58.0	.075	.08	.27	648	.25	77	69	62	5.1-O	3.2-Y	70.3
146	71.7	37.2	493	3.6	10.5	17.7	21.4	46.8	.087	.08	.27	362	.21	81	72	64	5.8-O	3.2-Y	73.0
178	51.7	32.9	368	1.2	4.3	16.3	23.0	55.3	.077	.05	.23	420	.23	79	71	64	5.1-O	2.7-Y	71.8
168	23.6	89.2	190	6.1	14.0	14.5	17.0	48.4	.088	.25	.68	1408	.28	81	72	65	5.8-O	2.3-Y	73.1
179	24.3	76.4	238	3.6	7.5	18.4	19.8	50.8	.083	.18	.46	1073	.26	79	73	66	3.8-O	3.6-Y	73.4
180	24.9	64.8	252	5.3	8.3	18.6	18.4	49.4	.085	.18	.51	981	.27	78	69	63	5.8-O	1.4-Y	70.2
201	39.7	70.2	272	20.9	11.0	14.1	14.5	39.5	.103	.22	.72	953	.23	80	71	62	5.8-O	4.1-Y	71.9
Stone surface in Series 1 to 6 inclusive, 8 and 10 [11]																			
122	44.0	47.2	350	1.7	6.0	15.7	22.9	53.7	.079	.11	.39	725	.26	81	72	68	5.1-O	0.2-R	73.3
139	48.8	56.6	318	1.9	8.5	15.9	22.0	51.7	.081	.11	.33	768	.25	79	70	63	5.8-O	2.3-Y	71.1
150	46.4	49.8	375	3.4	7.0	18.3	19.0	52.3	.081	.09	.49	580	.23	82	74	65	5.1-O	4.5-Y	74.6
163	42.9	49.7	358	4.1	7.8	17.4	21.1	49.7	.084	.10	.48	621	.25	81	74	66	4.5-O	4.0-Y	74.5
Miscellaneous tests for comparison																			
169	42.2	96.1	158	7.1	11.8	13.3	15.1	52.8	.083	.39	.67	2530	.34	81	75	69	3.8-O	2.7-Y	75.5
170	55.1	56.8	230	15.4	10.0	13.5	15.1	46.0	.092	.30	.84	1512	.28	81	75	70	3.8-O	1.8-Y	75.6
P1037	...	...	230	5.4	8.8	10.8	5.2	69.8	.069	.21	.63	950	.22	85	77	71	5.1-O	1.8-Y	77.9
P1101	...	...	375	18.0	12.4	12.5	16.5	40.7	.101	.24	.71	1273	.28	73	64	57	5.8-O	2.3-Y	65.1

[10] The pattern of the stone surface for grinder runs 122, 132, 146, and 168 was as described in Table I, footnote 3. Prior to grinder runs 176 to 180, inclusive, the stone had been dressed with a 9-cut, 4½- inch lead, spiral burr and in service 60 hours. The surface at this time was sharp but near the point beyond which change was expected to be slow.

[11] These runs were made periodically throughout the course of the experiments to note whether an appreciable change in stone surface was occurring. See text regarding data for Series 10 on effects of temperature and consistency.

temperatures, provided high consistencies are avoided by the use of warmed shower water. Increasing the plasticity of the wood by preheating it in water to the grinding temperature had relatively small effect as compared with elevating the pit temperature. It is believed that much benefit may be obtained, not only in the grinding of pine but in grinding other species as well, by conserving the heat of grinding and returning it to the grinder in white water at higher temperatures than customarily employed. The advantageous effect of a higher temperature noted in the work referred to prompted the use of a temperature of 190 deg. F. in the later work shown in Table II.

Miscellaneous Tests for Comparison

In Table IV are shown several tests made for comparison with the pine experiments. Grinder runs 169 and 170 were made with green black spruce. Comparing the results with those obtained in somewhat similar runs on pine (grinder runs 144 and 145, series 8), it may be noted that for an equal power consumption on this stone surface higher pressures are required with spruce, which not only grinds faster but yields pulps of much higher strength. In grinder run 170 (black spruce) pulp of higher than average quality was produced at somewhat below average power consumption.

Comparison of the pulp from grinder run 168 (series 9) with the commercial spruce pulps P 1037 and P 1101 indicates that this pine pulp is equal to the commercial pulps insofar as pulp tests are concerned. The pulps from grinder runs 201, 202, 203, and 211 (table II) also compare very favorably with these commercial pulps in all strength, color, and suspension properties.

Newsprint Paper Tests

It was not possible to make paper machine tests on the relatively small amounts of pulp produced in the foregoing experiments except in a few cases. The pulp from grinder run 211 and two other, especially prepared from fast-growth wood for paper machine runs, were made into newsprint papers which were standard in every respect. These groundwoods were combined with either pine sulphite or pine semibleached kraft. The pulp from another special grinder run of slow-growth wood was made into a newsprint sheet in combination with semibleached kraft and was satisfactory from the standpoint of strength and finish and only slightly darker in color than average news. The details of these newsprint tests are to be discussed when the results of the chemical pulping work are reported.

Conclusions

These results confirm the feasability of producing groundwood pulp from southern pine that is suitable for use in newsprint and related paper products provided a proper selection of wood is made and a limited range of grinding conditions adhered to. The segregating of wood according to growth rate and age and the close control of the grinding process are departures from present practice in groundwood manufacture but do not present insurmountable difficulties. From an experimental point of view a pilot plant demonstration of several months duration would seem to be the next logical step in the development of this project.

Literature Cited

(1) W. G. McNaughton and W. F. Allen. "Georgia Pine Sulphite and Groundwood for Newsprint". *Paper Trade J.* 97, No. 2; 36 (July 13, 1933).

(2) L. C. Anderson. "Report on the Manufacture of Newsprint from Southern Pine Under Commercial Operating Conditions". *Paper Trade J.* 98, No. 9; 31 (Mar. 1, 1934).

(3) R. I. Wynne-Roberts. "Grinding Characteristics of Various Woods". *Paper Trade J.* 104, No. 6; 46 (Feb. 11, 1937) TS 74.

(4) W. J. Walker. "Grinding of Southern Pine Under Semi-Commercial Conditions." *Paper Trade J.* 105, No. 12; 44 (Sept. 16, 1937). TS 168.

(5) J. H. Thickens. "Experiments with Jack Pine and Hemlock for Mechanical Pulp". U. S. Dept. Agric., Forest Products Laboratory unnumbered bulletin, (1912).

(6) J. H. Thickens and G. C. McNaughton. "Groundwood Pulp". *U. S. Dept. Agric. Bull. 343* (1916).

(7) C. E. Curran et al. "Pulping and Papermaking Properties of Selected New Zealand Woods". *New Zealand State Forest Service Bulletin No. 6* (1930).

(8) C. E. Curran. "Some Relations Between Growth Conditions, Wood Structure and Pulping Quality". *Paper Trade J.* 103, No. 11; 36 (Sept. 10, 1936) TS 200.

(9) E. R. Schafer and J. C. Pew. "Effect of Temperature and Consistency in Mechanical Pulping". *Paper Trade J.* 101, No. 13; 71 (Sept. 26, 1935) TS 167.

(10) M. Y. Pillow, E. R. Schafer, and J. C. Pew. "Occurrence of Compression Wood in Black Spruce and Its Effect on Properties of Groundwood Pulp". *Paper Trade J.* 102, No. 16; 36 (April 16, 1936) TS 220.

(11) Chas. H. Herty. "Wood in the South for Newsprint". *Paper Mill and Wood Pulp News*, 58, No. 2; 20 (Jan. 12, 1935).

(12) E. R. Schafer, J. C. Pew, and R. G. Knechtges. "Effect of High Pit Temperatures and of Preheating of the Wood on the Grinding of Loblolly Pine.". *Paper Trade J.* 103, No. 2; 29 (July 9, 1936) TS 41.

Wins Decision in Patent Case

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 15, 1937—The Fort Howard Paper Company, Green Bay, Wis., won a favorable decision from the Wisconsin Supreme Court last week in its case involving infringement of a patent by the Paper Converting Machine Company. Circuit Court Judge Henry Graass of Green Bay, has been ordered to appoint a referee to determine the amount of damages suffered by the paper company.

The high court upheld the decision of Judge Graass made September 29, 1936, granting the Fort Howard firm an injunction and an accounting of profits made by the machine company from construction of paper napkin manufacturing machines which involved principles of the "Havanap" fold patented in 1925.

Prior to June 21, 1927, the Fort Howard Company was commercially engaged in the manufacture and sale of napkins then referred to as "Cornucopia" and "Havanap" types. They were distinguished by a peculiar type of oblong fold and a pull tab. The firm controlled the "Havanap" patent issued to Peter J. Christman, associated with the firm.

The Paper Converting Machine Company, holding patents on a square fold napkin, built machines which the Howard firm officials said would infringe on their patents. Subsequent conferences led to an agreement by which the machine company was licensed to make, use and sell certain forms of paper folding machines embodying features of the Christman patent. The agreement provided that "this license does not extend to machines producing 'Cornucopia' folds sheets, or sheets the creases of which outline a star, or sheets known to the trade as the 'Havanap' fold." It was signed by A. E. Cofrin, president, and C. I. Smith, secretary, of the paper company, and B. L. Walter, president, and F. W. Christman, secretary, of the machine company. The defendant company denied it had infringed on the patents, and appealed the case before a referee could be appointed.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS
WEEK ENDING NOVEMBER 13, 1937
SUMMARY

Cigarette Paper .....673 cs.
Wall Paper .....10 bls., 55 bxs., 20 cs.
Paper Hangings .....1 ble.
Wall Board .....185 bdls.
Printing paper .....125 rolls, 99 bls., 5 cs.
Wrapping paper .....820 rolls, 70 bls., 1 cs.
Newsprint .....7062 rolls
Packing paper .....60 bls., 7 cs.
Filter Paper .....13 cs.
Drawing Paper .....2 cs.
Colored Paper .....34 cs.
Surface Coated Paper .....70 cs.
Surface baryta coated paper .....164 crates, 30 cs.
Metal Covered Paper .....5 cs.
Basic Paper .....52 crates
Coated Paper .....2 cs.
Photo Paper .....4 cs.
Transfer Paper .....4 cs.
Tissue Paper .....50 cs.
Decalcomania Paper 40 cs. 33 drums (duplex) 5cs. (simplex)
Shelf Paper .....80 ctns.
Crepe Paper .....45 ctns.
Imitation Ivory Board .....11 cs.
Gummed Paper .....11 cs.
Card Board .....9 cs.
Wood Pulp Paper .....2 bls.
Straw Board .....139 rolls
Marble Paper .....1 cs.
Transparent Paper .....4 cs.
Miscellaneous Paper .....451 rolls, 19 bbls., 44 cs.

CIGARETTE PAPER

Champagne Paper Corp., *Schodack, Bordeaux*, 103 cs.
Champagne Paper Corp., *Normandie, Havre*, 552 cs.
De Mauduit Paper Corp., *Normandie*, Havre, 2 cs.
Standard Products Corp., *Normandie*, Havre, 16 cs.

WALLPAPER

——, *Britannic*, London, 6 cs. 10 bls.
——, *Pr. Harding*, Havre, 5 cs.
S. K. Lonegren, *Drottningholm*, Gothenburg, 55 bxs.
——, *Washington*, Havre, 9 cs.

PAPERHANGINGS

W. H. S. Lloyd & Co., *Britannic*, London, 1 ble.

WALLBOARD

A. Johnson & Co., Inc., *Drottningholm*, Gothenburg, 185 bdls.

NEWSPRINT

Jay Madden Corp., *Pr. Harding*, Hamburg, 771 rolls.
H. G. Craig Co. Inc., *Kermic*, Donnacona, 320 rolls.
H. G. Craig Co., Inc., *A. C. D.*, Donnacona, 319 rolls.
Jay Madden Corp., *Rydboholf*, Kotka, 575 rolls.
Lunham & Reeve, Inc., *Rydboholm*, Kotka, 553 rolls.
N. Y. Evening Journal, *Rydboholm*, Kotka, 378 rolls.
Gilman Paper Co., *Rydboholm*, Hallstavik, 666 rolls.
Brooklyn Daily Eagle, *Rydboholm*, Hallstavik, 557 rolls.
N. Y. Evening Journal, *Rydboholm*, Norrkoping, 1216 rolls.
——, *Bergensfjord*, Oslo, 350 rolls.
——, *Bergensfjord*, Skien, 356 rolls.
Jay Madden Corp., *Washington*, Hamburg, 345 rolls.
Jay Madden Corp., *Hansa*, Hamburg, 349 rolls.
Perkins Goodwin & Co., *Hansa*, Hamburg, 307 rolls.

PRINTING PAPER

Jay Malden Corp., *Pr. Harding*, Hamburg, 40 bls, 125 rolls.
E. Dietzgen & Co., *Hansa*, Hamburg, 5 cs.
——, *Hansa*, Hamburg, 59 bls.

WRAPPING PAPER

Jay Madden Corp., *Pr. Harding*, Hamburg, 28 rolls.
——, *Westernland*, Antwerp, 1 cs.
Chase National Bank, *Drottningholm*, Gothenburg, 232 rolls.
Lunham & Reeve, Inc., *Drottningholm*, Gothenburg, 70 bls., 560 rolls.

PACKING PAPER

J. P. Heffernan Paper Co., *Excambion*, Genoa, 60 bls.
British American Toffee Co., *Spaarnaam*, Rotterdam, 7 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *Britannic*, London, 11 cs.
H. Reeve Angel & Co., Inc., *American Merchant*, London, 2 cs.

DRAWING PAPER

Japan Paper Co., *American Merchant*, London, 2 cs.

COLORED PAPER

J. W. Hampton, Jr., Co., Inc., *Black Condor*, Antwerp, 2 cs.
——, *Hansa*, Hamburg, 2 cs.
International F'd'g Co., *Hansa*, Hamburg, 30 cs.

SURFACE COATED PAPER

C. Happel, *Pr. Harding*, Hamburg, 23 cs.
Gevaert Co., of America, *Westernland*, Antwerp, 32 cs.
Gevaert Co., of America, *Black Condor*, Antwerp, 11 cs.
C. Happel, *Hansa*, Hamburg, 4 cs.

SURFACE BARYTA COATED PAPER

W. Bersch, *Washington*, Hamburg, 21 cs.
Globe Shipping Co., *Hansa*, Hamburg, 164 crates
——, *Hansa*, Hamburg, 9 cs.

METAL COVERED PAPER

C. H. Forsman & Co., *Hansa*, Hamburg, 5 cs.

BASIC PAPER

Globe Shipping Co., *Hansa*, Hamburg, 52 crates

COATED PAPER

W. J. Byrnes, *Aquitania*, Southampton, 2 cs.

PHOTO PAPER

Medo Photo-Supply Co., *Britannic*, London, 4 cs.

TRANSFER PAPER

D. C. Andrews & Co., *Hansa*, Hamburg, 4 cs.

TISSUE PAPER

——, *Sanyo Maru*, Kobe, 50 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Franconia*, Liverpool, 40 cs., 33 drums (duplex); 5 cs. (simplex).

SHELF PAPER

G. H. Akermark, *Drottningholm*, Gothenburg, 75 ctns.
Abraham & Strauss, *Drottningholm*, Gothenburg, 5 ctns.

CREPE PAPER

G. H. Akermark, *Drottningholm*, Gothenburg, 45 ctns.

IMITATION IVORY BOARD

R. Wilson Paper Corp., *Spaarndam*, Rotterdam, 11 cs.

GUMMED PAPER

Heemsoth Kerner Corp., *Bremen*, Bremen, 11 cs.

CARD BOARD

International F'd'g. Co., *Spaarndam*, Rotterdam, 9 cs.

WOOD PULP PAPER

A. Giese & Son, *Spaarndam*, Rotterdam, 2 bls.

STRAW BOARD

——, *Spaarndam*, Rotterdam, 139 rolls.

MARBLE PAPER

Tamm & Co., *J. Jadot*, Antwerp, 1 cs.

TRANSPARENT PAPER

M. J. Corbett & Co., *Spaarndam*, Rotterdam, 4 cs.

MISCELLANEOUS PAPER

The Borregaard Co., Inc., *Drottningholm*, Gothenburg, 451 rolls.
Jay Madden Corp., *Rydboholm*, Kotka, 19 bbls.
National City Bank, *Sanyo Maru*, Yokohama, 6 cs.
W. J. Byrnes, *Washington*, Southampton, 4 cs.
Keuffel & Esser Co., *Hansa*, Hamburg, 34 cs.

RAGS, BAGGINGS, ETC.

S. Shapiro & Sons, *Pilsudski,* Gdynia, 39 bls. rags.
———, *Britannic,* London, 53 bls. bagging.
Jaffe Products Co., *Oriente,* Havana, 305 bls. rags.
———, *Franconia,* Liverpool, 10 bls. rags.
T. D. Downing & Co., *Transylvania,* Glasgow, 212 bls. bagging.
———, *Westernland,* Antwerp, 62 bls. rags, 10 bls. flax waste.
Philadelphia National Bank, *Westernland,* Antwerp, 87 bls. rags.
Chase National Bank, *Westernland,* Antwerp, 116 bls. flax pulp.
Van Oppen & Co., *Black Condor,* Antwerp, 81 bls. rags, 45 bls. bagging.
J. S. Keene, Inc., *American Merchant,* London, 31 bls. paper stock.
———, *American Merchant,* London, 113 bls. waste strings.
Castle & Overton, Inc., *Spaarndam,* Rotterdam, 46 bls. bagging.
Hicks Costarino & Co., *Excambion,* Alexandria, 95 bls. rags, 76 bls. bagging
———, *Excambion,* Alexandria, 42 bls. rags.
W. Steck & Co., *Excambion,* Alexandria, 88 bls. bagging.
E. J. Keller Co., Inc., *Excambion,* ———, 16 bls. paper stock.
D. Benedetto, Inc., *Schodack,* Havre, 137 bls. rags, 62 bls. string waste.
J. T. Flannery, *Schodack,* Havre, 43 bls. rags.
W. Steck & Co., *Schodack,* Havre, 34 bls. new cuttings.
Keene, Inc., *Schodack,* Havre, 34 bls. rags.
Castle & Overton, Inc., *Schodack,* Havre, 44 bls. bagging.
Castle & Overton, Inc., *Schodack,* St. Nazaire, 59 bls. rags, 266 bls. bagging.
Chase National Bank, *Schodack,* Bordeaux, 185 bls. rags.
Irving Trust Co., *Estrella,* Marseilles, 83 bls. rags.
E. J. Keller Co., Inc., *Sanyo Maru,* ———, 80 bls. paper stock.
E. J. Keller Co., Inc., *West Cusseta,* ———, 120 bls. paper stock.

BONE GLUE

R. Coff, *Black Hawk,* Rotterdam, 300 bags bone glue.
———, *Saturnia,* Trieste, 150 bags bone glue (ground); 200 bags bone glue (pearl); 100 bags bone glue (sheet).

OLD ROPE

Banco Coml Italiane Trust Co., *Pilsudski,* Gdynia, 80 coils.
Banco Coml Italiane Trust Co., *Transylvania,* Glasgow, 68 coils.
Banco Coml Italiane Trust Co., *R. Maersk,* London, 63 coils.
———, *R. Maersk,* London, 160 coils.
T. D. Downing & Co., *Black Condor,* Rotterdam, 29 coils.
T. D. Downing & Co., *Black Condor,* Antwerp, 28 coils.
W. Steck & Co., *Spaarndam,* Rotterdam, 120 coils.
W. Steck & Co., *Guilo,* Hull, 51 coils.

CHINA CLAY

English China Clays Sales Corp., *Franconia,* Liverpool, 20 casks.

WOOD PULP

Guaranty Trust Co., *Pr. Harding,* Hamburg, 498 bls. sulphite, 99 tons.
Absorbo Beer Pad Co., *Saturnia,* Trieste, 380 bls. wood pulp.
M. Sone, *Drottningholm,* Gothenburg, 254 bls. kraft pulp.
Price & Pierce, Ltd., *Drottningholm,* Gothenburg, 325 bls. unbleached sulphite.
Castle & Overton, Inc., *Rydboholm,* Viipuri, 610 bls. wood pulp.
Lagerloef Trading Co., *Hammaren,* Kemi, 4917 bls. sulphate.
Perkins Goodwin & Co., *Bergensfjord,* Drammen, 1000 bls. sulphite.
Irving Trust Co., *Bergensfjord,* Oslo, 250 bls. chemical pulp.
J. Andersen & Co., *Bergensfjord,* Oslo, 500 bls. sulphite.
E. M. Sergeant Pulp & Chemical Co., *Bergensfjord,* Nygard, 300 bls. chemical pulp.
Bulkley Dunton Pulp Co., Inc., *Spaarndam,* ———, 768 bls. wood pulp.
A. Giese & Son, *Spaarndam,* Rotterdam, 25 bls. wood pulp.
Bank of N. Y. Trust Co., *Hansa,* Hamburg, 555 bls. wood pulp, 111 tons.
Castle & Overton, Inc., *Hansa,* Hamburg, 825 bls. wood pulp, 165 tons.

WOOD PULP SHEETS

C. Bishop & Co., *Washington,* Hamburg, 26 bls.

WOOD PULP BOARDS

Darcy Export Co., *Drottningholm,* Gothenburg, 22 bls.
J. J. Madden Corp., *Rydboholm,* Kotka, 95 pkgs., 66 bls.
———, *Rydboholm,* Viipuri, 64 rolls.
Flexideal Dry Mat Co., *Washington,* Hamburg, 125 cs.
Fibre Products Manfg. Co., *Washington,* Hamburg, 29 bls.
Dohner Gehrig & Co., *Washington,* Hamburg, 25 bls.

NEWARK IMPORTS

WEEK ENDING NOVEMBER 13, 1937

H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 315 rolls newsprint.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 13, 1937

Price & Pierce, Ltd., *Consul Corfitzon,* Hernosand, 4200 bls. sulphite, 700 tons.
Pagel Horton & Co., Inc., *Consul Corfitzon,* Gefle, 10,000 bls. sulphite, 1000 tons.
———, *Consul Corfitzon,* Gefle, 3500 bls. sulphite, 700 tons.
Gottesman & Co., Inc., *Consul Corfitzon,* Gefle, 2000 bls. sulphite, 200 tons.
Gottesman & Co., Inc., *Consul Corfitzon,* Ronneby, 4500 bls. chemical pulp, 765 tons.
Bulkley Dunton Pulp Co., Inc., *Consul Corfitzon,* ———, 4819 bls. sulphite, 749 tons.

PORTLAND IMPORTS

WEEK ENDING NOVEMBER 13, 1937

Lagerloef Trading Co., *Hammaren,* Kemi, 630 bls. sulphite; 13,025 bls. sulphate.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 13, 1937

Elliott Addressing Machine Co., *Triton,* Yokohama, 11 cs. paper.
Lagerloef Trading Co., *Hammaren,* Kemi, 10,476 bls. sulphate.
———, *Hammaren,* Sundsvall, 1284 bdls. wall boards.
Treetex Corp., *Hammaren,* Sundsvall, 2220 bdls., 14 bxs. wall board.
International Purchasing Co., *Black Hawk,* Antwerp, 100 bls. old rope.
———, *Black Hawk,* Antwerp, 115 bls. rags.
W. J. Green, *Excambion,* Alexandria, 91 bls. rags.
C. H. Powell Co., *Sanyo Maru,* Osaka, 3 cs. wall paper.
Parsons & Whittemore, Inc., *Ermland,* ———, 1400 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 13, 1937

Lagerloef Trading Co., *Rydboholm,* Viipuri, 3688 bls. sulphite, 130 bls. sulphate.
Neidich Process Co., *Rydboholm,* Kotka, 70 pkgs. paper.
J. W. Hampton, Jr., Co., Inc., *Rydboholm,* Kotka, 427 rolls newsprint.
Philadelphia Inquirer, *Rydboholm,* Hallstavik, 503 rolls newsprint.
E. J. Keller Co., Inc., *Black Condor,* ———, 331 bls. rags.
E. J. Keller Co., Inc., *Schodack,* ———, 403 bls. rags.
E. J. Keller Co., Inc., *Vinni,* ———, 124 bls. paper stock.
W. F. Sherwood & Sons, *Black Condor,* Antwerp, 122 bls. rags.
Gottesman & Co., Inc., *Bockenheim,* Sweden, 750 bls. sulphite, 3975 bls. sulphate.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 13, 1937

Congoleum Nairn Co., *Schodack,* Havre, 1671 bls. rags.
Congoleum Nairn Co., *Schodack,* St. Nazaire, 375 bls. rags.
Congoleum Nairn Co., *Schodack,* Bordeaux, 238 bls. rags.
Pagel Horton & Co., Inc., *Vigor,* Sweden, 750 bls. wood pulp.
Parsons & Whittemore, Inc., *City of Havre,* ———, 1622 bls. wood pulp.
M. Sone, *Lucia C.,* Trieste, 1190 bls. wood pulp.

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

WHY NOT

REDUCE YOUR FOURDRINIER WIRE COSTS BY USING A WIRE THAT WILL GIVE YOU ALL AROUND SERVICE.

USE

A WIRE WITH A NON-CRACK PATENTED SELVIDGE

PURVES WIRES

ARE AS GOOD AS THE BEST.

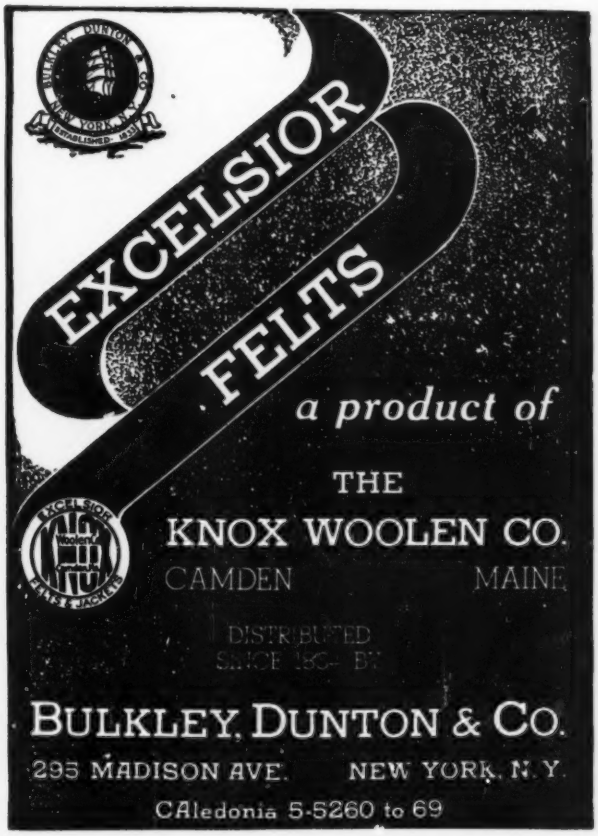
PURVES MACHINE WIRE COMPANY, INC.
HOLYOKE, MASSACHUSETTS

Mundt

Perforated Screens
For Pulp and Paper Mills

Steel, Copper, Brass
Bronze, Monel Metal
and Other Alloys
Punched for Centrifugal
and Rotary Screens,
Pulp Washers, Drainer
Bottoms, Filter Plates, etc.

Charles Mundt & Sons
63 Fairmount Ave. Jersey City, N. J.



New York Market Review

Office of the PAPER TRADE JOURNAL.
Wednesday, November 17, 1937.

The wholesale paper markets report consumer demand for all grades as very light, with sales volume down slightly in some grades of paper for the current week. The general opinion is that very little improvement in demand can be looked for during the balance of the year. So far as the future is concerned, the paper trade is, of course, influenced by the same adverse factors which now complicates the whole national business situation. The major portion of the light volume of business now being transacted continues on the hand-to-mouth basis which has prevailed for some weeks. Prices, in general, remain firm, with here and there some small spot orders filled at less than former spot prices.

The newsprint market continues normally active, with contact orders moving in good volume.

The writing paper market reports business as slow, with no change for the week. The same condition applies to many other grades of paper. The demand for tissues also continues slow.

In the kraft paper market little change is reported for this week. Demand is reported as light. Prices continue to hold firm.

The box board market reports demand as very light. The unsatisfactory condition of this market is stated to be substantially the same as in other paper products and also present in other commodity markets. This is due to heavy buying months ago, a lighter than expected demand in the interim, which leaves adequate stocks on hand to meet the light consumer demand of the present.

Chemical Pulp

The demand for chemical pulp continues very light and the trend in demand and prices is downward, though market prices remain unchanged for the week.

Mechanical Pulp

The mechanical pulp market is quiet. Prices remain firm and no change is reported in the prices which have prevailed for some weeks.

Old Rope and Bagging

The demand for old rope continues very slow. Prices are about on the same level as the preceding week. The domestic bagging market continues quiet. Prices are unchanged for this week.

Rags

The demand for domestic rags is very slow. No further decline in prices are reported for the current week. The foreign rag market continues active and nominal quotations prevail.

Waste Paper

The waste paper market is very quiet. Declines in prices are reported for the current week in some grades of flat stock, old kraft and in strictly folded news and in No. 1 mixed paper.

Twines

The twine market reports trading as very quiet. Prices continue at about the levels of last week.

Marvellum Advertising Wins Award

Unusual attractiveness, color harmony and general effectiveness of the nine advertising pieces of the Marvellum Paper Company, Holyoke, Mass., were awarded first prize in the Direct Mail Division at the National Advertising Agencies Network Convention, held at Milwaukee, September 4 to 6, 1937.

This series was designed as inserts and direct mail pieces for distribution to jobbers, printers and advertisers, both rubber and zinc plates being used to print these.

In recent months, the Marvellum Company has been enjoying unusually fine sales, which is attributed in part, to the proper promotion of a very distinctive line of cover papers.

This campaign was prepared for the Marvellum Company by Charles E. Vautrain Association, Inc., of Holyoke, Mass., who will receive a plaque for their part in the preparation and production of this advertising.

Union Bag Appeals Tax Case

HUDSON FALLS, N. Y., November 15, 1937—The Union Bag and Paper Corporation has filed notice of an appeal from the decision of Justice Rogers in sustaining the village in the certiorari proceedings brought to obtain a reduction of the tax assessment on the corporation property here. Arguments on the appeal will be heard at a later date by the Appellate Division of the Supreme Court. In his recent decision Judge Rogers held that the assessment of $709,004 arrived at by the village assessors was fair and just and, accordingly, a judgment quashing the writ was filed several weeks ago.

A New Hancock Valve

A bulletin describing the new "Duravalve," has been issued by the Hancock Valve Division, Maxwell & Moore, Inc., of Bridgeport, Conn. The new valve is provided with a leak-proof "Stillite" seat, designed for high pressure and high temperature service.

West Virginia Pulp and Paper Company

230 Park Ave. New York
35 East Wacker Drive Chicago
503 Market St., San Francisco, Cal.
Public Ledger Building, Philadelphia, Pa.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

. . . .

KRAFT WRAPPING AND KRAFT ENVELOPE.
KRAFT CYLINDER BOARD.
BLEACHED SULPHITE AND SODA PULP.
BLEACHED AND UNBLEACHED KRAFT PULP.

MILLS:

Mechanicsville, New York — Tyrone, Pennsylvania
Luke, Maryland — Williamsburg, Pennsylvania
Covington, Virginia — Cass, West Virginia
Charleston, South Carolina.

3 LARGE PLANTS TO SERVE USERS OF SOLVAY

TRADE MARK REG. U. S. PAT. OFF.

Liquid Chlorine

Solvay's new plants make service an important factor to be considered when you place your orders for Liquid Chlorine. Solvay's new Chlorine plant at Hopewell, Va., now quickens deliveries into the Middle Atlantic and Southern States. The Solvay Syracuse plant supplies New England and the Lake Region States. *In 1938 a new Chlorine plant at Baton Rouge, La., will further increase Chlorine service in the South and Southwest!* Write immediately to find out how these new Solvay services will benefit you.

SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 RECTOR STREET NEW YORK

NOPCO

Foam Killers — Wax Sizes
Soluble Oils — Levelers
Eveners

NATIONAL OIL PRODUCTS COMPANY
HARRISON, N. J.
Boston Chicago Cedartown, Ga. San Francisco

"COOPER 22"

The Original Chrome Nickel Alloy for the Paper Mill
CORROSION - HEAT - ABRASION RESISTING
Special Castings, Fittings, Valves, Pipe, etc.
THE COOPER ALLOY FOUNDRY CO.
ELIZABETH, NEW JERSEY

H. G. WEBER & COMPANY

Builder of High Speed Bag Machines

Grocery, Duplex, Coffee, Flour, Cellophane Satchel Bottom, Tuber & Bottomers Automatic Compensating Device.

KIEL WISCONSIN

Magnus SLIME REMOVER

Quickly and thoroughly removes all slime deposits from piping, wires, filters, equipment, etc.

MAGNUS CHEMICAL CO. GARWOOD, N.J.

HIGHEST GRADE CLAYS

EASTON PAPER MAKERS IMPORTING CO. INC. EASTON, PENNSYLVANIA, U.S.A.

COATING FILLING

POWDERED

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 17, 1937.

BLANC FIXE—The blanc fixe market is steady. Prices are firm and conform to the level of the preceding week. Quotations of the pulp range at from $42.50 to $45 per ton, in bulk. The powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The demand for bleaching powder continues steady. Prices are unchanged for the week. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market reports demand as fair. Prices are unchanged for the week. Domestic standard ground casein is quoted at 13 cents per pound; domestic finely ground casein at 14 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—The demand for caustic soda continues steady. Prices are firm and unchanged. Solid caustic soda is offered at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is steady. Prices remain firm and unchanged for the week. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—The demand for chlorine is about on the level of the preceding week. Prices are firm and unchanged. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as fair for the week. Prices of some grades are lower. Paper making rosin is quoted at $6.40; wood rosin at $7.05 per 280 pounds, gross weight, in barrels at Savannah. Seventy per cent rosin size is quoted at $3.17 per 100 pounds, in tank cars, f.o.b., shipping point.

SALT CAKE—The soda ash market reports demand and prices as conforming to the level of the preceding week. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12, f.o.b, shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The soda ash market reports demand as steady. Prices are firm. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows; in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The demand for starch is reported as moderate. Prices for the current week are lower. Globe pearl starch is quoted at $2.75 per 100 pounds, in bags, and at $3.40 in barrels. Special paper starch is offered at $2.85 per 100 pounds, in bags, and at $3.10 in barrels. All prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—The sulphate of alumina market is steady. Prices are firm. The commercial grades are quoted at from $1.25 to $1.60; iron free at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The demand for sulphur is moderately active. Prices are firm and conform to the quotations of last week. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are quoted at $21 per ton.

TALC—The talc market reports demand as moderate. Prices are firm. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Paper

Tissues—Per Ream—

White No. 1	1.10	@	—
White No. 1 M. G.	1.07½	@	—
White No. 1½	.77½	@	—
White No. 2	.75	@	—
Anti-Tarnish M. G.	.77½	@	—
Colored	.90	@	—
Kraft	.77½	@	—
Manila	.75	@	—
Unbleached Toilet	2.90	@	3.30
Bleached Toilet	3.94	@	5.26

Paper Towels—

Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70

Manila—

No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00

Fibre Papers—

No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—

Roll, contract	42.50	@	—
Sheets	47.50	@	—

Kraft—

No. 1 Northern	5.25	@	5.75
Standard	5.00	@	—
Southern	4.50	@	—
Machine glazed, plain, striped	5.00	@	—

Boards, per ton—

News	37.50	@40.00
Chip	37.50	@40.00
Sgl. Mla. Ll. Chip	52.50	@ —
Jute Lined Chip	52.50	@ —
White Pat. Coated	65.00	@67.50
Kraft Liners	55.00	@ —
Binders Boards	75.00	@80.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$41.40@$48.50	$42.55@$50.00
100% Rag	32.80@ 38.50	33.95@ 39.75
85% Rag	.....	32.20@ 37.75
75% Rag	24.75@ 29.00	25.90@ 30.50
65% Rag	21.65@ 26.25	22.80@ 27.75
50% Rag	18.70@ 22.75	19.90@ 24.25
25% Rag	15.80@ 19.25	16.95@ 20.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$9.35@$11.50	$10.55@$12.75
No. 2	8.50@ 10.25	9.65@ 11.75
No. 4	7.60@ 9.25	8.80@ 10.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$12.15@$14.25
No. 2 Glossy Coated	10.55@ 12.25
No. 3 Glossy Coated	9.35@ 11.00
No. 4 Glossy Coated	8.80@ 10.50
No. 1 Antique (water-marked)	8.80@ 10.50
No. 2 Offset	8.05@ 9.50
A Grade E. F.	7.90@ 9.50
A Grade S. & S. C.	8.15@ 9.75
B Grade E. F.	7.30@ 8.75
B Grade S. & S. C.	7.55@ 9.00
C Grade E. F.	7.00@ 8.50
C Grade S. & S. C.	7.25@ 8.75
D Grade E. F.	6.75@ 8.25
D Grade S. & S. C.	7.00@ 8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—

Moist	35.00	@36.00
Dry	40.00	@42.00

(Delivered)

No. 1 Domestic and Canadian	36.00	@37.50

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—

Prime Bleached Sulphite	3.50	@	4.65
Prime Qualities—Easy-Bleaching Sulphite	3.25	@	3.75
Strong Unbleached Sulphite	2.75	@	3.65

(On Dock, Atlantic Ports)

Kraft Bleached	4.00	@	4.75
Kraft Light & Strong	3.00	@	3.75
Kraft No. 1	2.75	@	3.65
Kraft No. 2	2.50	@	2.75

(F.o.b. Pulp Mill)

Kraft Domestic	2.00	@	2.50

(Delivered)

Soda Bleached	3.25	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.34	@	8.00
Silesias, No. 1	6.25	@	6.50
New Unbleached	8.75	@	9.00
Blue Overall	6.25	@	6.50
Fancy	3.25	@	3.50
Washables	2.25	@	2.50
Mixed Khaki Cuttings	4.00	@	4.25
O. D. Khaki Cuttings	4.50	@	4.35

Old Rags

White, No. 1—			
Repacked	3.75	@	4.00
Miscellaneous	3.00	@	3.40
White, No. 2—			
Repacked	2.50	@	2.75
Miscellaneous	2.00	@	2.40
Thirds and Blues—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Roofing Rags—			
No. 1	1.30	@	1.40
No. 2	.80	@	.90
No. 3 (bagging)	.70	@	.80
No. 4	.70	@	.80
No. 5A	.65	@	.70

Foreign Rags

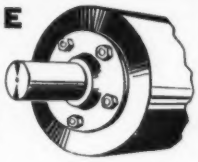
New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.30
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	5.50

PAPER MAKERS ARE PARTICULAR!



And their judgment selects Rodney Hunt's wood press rolls, as well as "Shaf-tite" felt rolls of wood, rubber or metal.

ALSO

Water Wheels and Turbines—Canal Gates—Gate Hoists—Racks and Rakes. Endless Felt Washers

RODNEY HUNT

Machine Company

63 Maple St. Orange Mass.

TRAYLOR

KILNS, COOLERS, DRYERS, SCRUBBERS, SLAKERS

Are used by many of the greatest chemical and process industries—a fact that paper manufacturers cannot afford to overlook

Write us for details—No obligation!

TRAYLOR ENGINEERING & MFG. CO.

ALLENTOWN, PENNSYLVANIA, U. S. A.

NEW YORK CITY 2616 Empire State Bldg. CHICAGO 2151 One LaSalle St. Bldg. SALT LAKE CITY 161 West Second South St. LOS ANGELES 919 Chester Williams Bldg. SEATTLE 6511 22nd Ave., N. E.

Pulp and Paper Mill Screens

Of Stainless Steel—Copper—Bronze—Monel—Chemical Resisting Alloys

Perforations that are accurate in size

Any Metal Any Perforation

The Harrington & King Perforating Co.

5652 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N.Y.

YOU BUY GUARANTEED PERFORMANCE when you Specify "Buffalo" PAPER STOCK PUMPS

BUFFALO PUMPS, INC.

443 BROADWAY – BUFFALO, N. Y.

Branch Engineering Offices in Principal Cities In Canada: Canada Pumps Ltd., Kitchener, Ont.

THE PUSEY AND JONES CORPORATION

Established 1848

WILMINGTON, DELAWARE

WOOD TANKS

STUFF CHESTS ACID
BLOW PIT PULP STORAGE
CHEMICAL LEAD LINED

ESTABLISHED 1854

WOOLFORD WOOD TANKS

PHILADELPHIA

G. WOOLFORD WOOD TANK MFG. CO.,
PASCHALL P. O., PHILADELPHIA, PA.

MISCO "C"

THE CORROSION RESISTANT ALLOY

CAST • ROLLED • FABRICATED

for all equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING CO., DETROIT, MICH

LINDSAY WIRES

Longerimp, Spiral Weave
Modified Longerimp
Duo-Wear and Regular Weave

They are all "Live Wires"

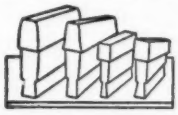
THE LINDSAY WIRE WEAVING COMPANY

14025 Aspinwall Ave., Cleveland, Ohio

WOOD COGS

OF ALL DESCRIPTIONS, BLANK OR FINISHED

From Thoroughly Seasoned New Hampshire Rock Maple



The Best Cog Stock in the World

THOMPSON MANUFACTURING CO.

Lancaster, - New Hampshire

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	3.00
No. 4 White Cotton	1.90	@	2.20
Extra Light Prints	2.00	@	2.40
Ord. Light Prints	1.75	@	2.15
Med. Light Prints	1.55	@	1.95
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.00	@	—
Checks and Blues	2.00	@	—
Linsey Garments	2.10	@	2.20
Dark Cottons	1.75	@	1.85
Old Shopperies	1.60	@	—
New Shopperies	1.60	@	—
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.50
Domestic	2.15	@	2.35
Wool Tares, light	1.50	@	1.75
Wool Tares, heavy	2.00	@	2.10
Bright Bagging	1.60	@	1.70
Manila Rope—			
Foreign	3.25	@	3.50
Domestic	3.50	@	3.75
Jute Threads	2.75	@	3.00
Sisal Strings	2.35	@	2.45
Mixed Strings	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.70	@	2.80
Ordinary Hard White No. 1	2.45	@	2.55
Hard White No. 2	2.25	@	2.35
Soft White No. 1	2.25	@	2.35
Flat Stock—			
Stitchless	.75	@	.85
Overissue Mag	.75	@	.85
Solid Flat Book	.55	@	.60
Crumbled No. 1	.45	@	.55
Ledger Stock	1.00	@	1.10
New B. B. Chips	.30	@	.35
Manila—			
New Env. Cut	2.00	@	2.15
New Cuttings	1.50	@	1.60
Old Kraft Machine—			
Compressed bales	.70	@	.75
News—			
No. 1 White News	1.25	@	1.35
Strictly Overissue	.55	@	.60
Strictly Folded	.27½	@	.30
No. 1 Mixed Paper	.15	@	.20

Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—			
India	.15	@	.16½
White Hemp	.16	@	.17½
Fine Polished—			
Fine India	.20	@	.22
Unpolished—			
Box	.11	@	.11½
Paper Makers	.11	@	.12¼
Tube Rope	.11½	@	.14¼
Wall Paper	.12½	@	.13¼
Wrapping	.14	@	.14½
Soft Fiber Rope	.13¾	@	.14¼

(Hard Fibre)

Medium Java	.12	@	.12¼
Mex. Sisal	.11	@	.11½
Manila	.21	@	.28

Domestic	3.25	@	3.50
Transmission Rope	1.90	@	2.00
Soft Jute Ropes	2.10	@	2.25
Jute Carpet Threads	1.50	@	1.75
Gunny No. 1—			
Foreign	2.35	@	2.40
Domestic	1.90	@	2.00
Bleachery Burlap	3.75	@	4.00
Scrap Burlap			
Foreign	2.00	@	2.15
Domestic	1.60	@	1.80
Scrap Sisal	1.90	@	2.00
Scrap Sisal for Shredding	2.50	@	2.65
Wool Tares, heavy	—	@	2.15
New Burlap Cuttings	2.45	@	3.00
Aust. Wool Pouches	3.50	@	3.65
Heavy baling bagging	2.25	@	2.30
Paper Mill Bagging	1.50	@	1.60
Bagging No. 2	.85	@	1.00

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.03	@	.03¼
New White No. 1	.07½	@	.07¾
New White No. 2	.05½	@	.05¾
New Light Flannelettes	—	@	.06
Silesias No. 1	.03¾	@	.04
New Black Silesias	.03¾	@	.04
Silesias No. 1			
Soft Unbleached	.08	@	.08¼
Blue Cheviot	.06¾	@	.07
Fancy	.03¼	@	.03½
Washable	.03	@	.03¼
Cottons—According to grades—			
Blue Overalls	.06½	@	.06¾
New Black, soft	.03¾	@	.04
Khaki Cuttings	.03½	@	.04
O. D. Khaki	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas	.07¼	@	.07¾
B. V. D. Cuttings	.08¼	@	.08¾

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.71
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.63½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	—	@	1.30
No. 2	1.07½	@	1.10
No. 3	.90	@	.95

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.35	@	1.50
Dutch Blues	2.85	@	3.00
New Checks and Blues	2.85	@	3.00
Old Fustians	2.50	@	2.60
Old Linsey Garments	1.90	@	2.00
New Silesias	6.00	@	6.50

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.07½	@	.08
New White, No. 2	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	—	@	.05½
Black Silesias, soft	.03	@	.03½
New Unbleached	.07½	@	.08
Washable, No. 1	.02	@	.02¼
Blue Overall	.04	@	.04½
Cottons—According to grades—			
Washable, No. 2	.01½	@	.01¾
New Blue	.01½	@	.01¾
Fancy Percales	—	@	.03½
New Black Soft	.03	@	.03½
New Light Seconds	—	@	.05½
New Dark Seconds	1.25	@	1.50
Khaki Cuttings—			
No. 1 O. D.	.03½	@	.04
No. 2 Mixed	—	@	.02¾
Corduroy	.02¾	@	.03
New Canvas	.06	@	.06½
New Black Mixed	.02	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	3.75
Miscellaneous	3.00	@	3.25
Thirds and Blues—			
Miscellaneous	—	@	1.75
Repacked	2.00	@	2.25
Black Stockings (Export)	4.00	@	4.50
Roofing Stock—			
Foreign No. 1	1.50	@	1.75
Domestic No. 1	—	@	1.25
Domestic No. 2	1.00	@	1.10
Roofing Bagging	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	—
Domestic	1.70	@	1.75
Manila Rope	3.00	@	3.25
Sisal Rope	2.00	@	2.25
Mixed Rope	1.00	@	1.10
Scrap—			
No. 1	1.50	@	—
No. 2	1.00	@	1.25
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.35	@	2.40
No. 2 Hard White	2.00	@	2.10
No. 1 Soft White	2.00	@	2.10
No. 2 Soft White	1.40	@	1.50
No. 1 Mixed	.70	@	.75
Solid Ledger Stock	1.50	@	1.60
Ledger Stock, white	1.25	@	1.30
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy	.85	@	.90
Manila Cuttings	1.50	@	1.75
Print Manila	.45	@	.50
Container Manila	—	@	.40
Kraft Paper	.90	@	.95
No. 1 Mixed Paper	.25	@	.30
Straw Board Chip	.25	@	.30
Binders Board Chip	.25	@	.30
Corrugated Board	.50	@	.55
Overissue News	.55	@	.60
Old Newspapers	.30	@	.35

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.40
No. 1 Soft White	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.90	@	1.00
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
Manila Env. Cuttings, extra quality	2.00	@	2.25
No. 1 Old Manila	.95	@	1.00
White Blank News	1.30	@	1.40
No. 1 Kraft	1.00	@	1.25
Mixed Papers	.22½	@	.25
Print Manila	.45	@	.50
Container Manilas	.27½	@	—
Old Newspapers	.25	@	.30
Paper Wool Strings	—	@	.60
Overissue News	.45	@	.50
Box Board Chips	.35	@	.40
Corrugated Boxes	.25	@	.30
Kraft corrugated boxes	.55	@	.80
Screenings wrappers	.45	@	.50

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	3.00	@	3.25

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	3.15	@	3.25
No. 1 Hard White	2.50	@	2.60
No. 1 Soft White	2.05	@	2.10
Ledger & Writings	1.30	@	1.40
Solid Books	1.20	@	1.25
Blanks	1.40	@	1.50
Krafts	.90	@	1.00
New Kraft Cuts	1.70	@	1.80
Manila Env. Cuts	2.15	@	2.25
Ex. No. 1 Manila	2.15	@	2.25
Print Manila	1.70	@	1.80
Overissue News	.60	@	.70
Old Newspapers—			
No. 1 Folded News	.45	@	.50
No. 1 Mixed Paper	.35	@	.40
Roofing Stocks—			
No. 1	2.00	@	2.10
No. 2	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	.36½
No. 1 Tints	.36½	@	.37½
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1550
No. 4 Tints	.16	@	.1650
No. 5 Bond—White	11.35	@	—
No. 5 Bond—Tints	12.35	@	—
No. 5 Bond—Golden Rod	13.35	@	—
No. 5 Ledger—White	.1185	@	—
No. 5 Ledger—Tints	.1285	@	—
No. 6 Bond—White	10.75	@	—
No. 6 Bond—Tints	11.25	@	—
No. 6 Bond—Golden Rod	12.75	@	—
No. 7 Bond—White	9.10	@	—
No. 7 Bond—Tints	9.60	@	—
No. 7 Bond—Golden Rod	11.10	@	—
Book—			
No. 1 M. F.	7.10	@	7.35
No. 2 M. F.	6.85	@	7.20
No. 3 M. F.	5.60	@	6.20
No. 1 S. C.	7.60	@	7.85
No. 2 S. C.	7.10	@	7.35
No. 3 S. C.	6.10	@	6.35
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.00	@	—
No. 3 Coated and Litho	9.50	@	10.00
Coated tinted	13.00	@	13.50
Wrapping—delivered—			
Rag Brown	4.85	@	5.55
White Wrap	4.00	@	—
"B" Manila	4.90	@	6.25
No. 1 Manila	5.50	@	7.00
Fiber	5.50	@	—
Kraft, No. 2	5.50	@	—

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)	38.50	@	—
Sheets	45.50	@	—

Pulp

Ground wood	32.00	@	—
Unbleached Sulphite	59.00	@	—
Book (Class 1)	71.00	@	—
Writing (Class 2)	72.00	@	—
Select (Class 3)	73.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.50	@	—
Soft White	2.15	@	—
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock	.85	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.65	@	—
Kraft	1.00	@	1.70
News and Scrap—			
Strictly Overissue	.65	@	—
Strictly Folded	.60	@	—
No. 1 Mixed Paper	.50	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09	@	.09½
Fancy Shirt Cuttings	.03½	@	.03¾